MINING AND PETROLEUM STANDARD
AND
AMERICAN GAS-LIGHT JOURNAL.

Devoted to Mining, Petroleum, Gas, Water Supply, and Scientific Subjects Generally.

PUBLISHING OFFICE NO. 22 PINE STREET.

VOLUME VIII—No. 12.
WHOLE No. 168.

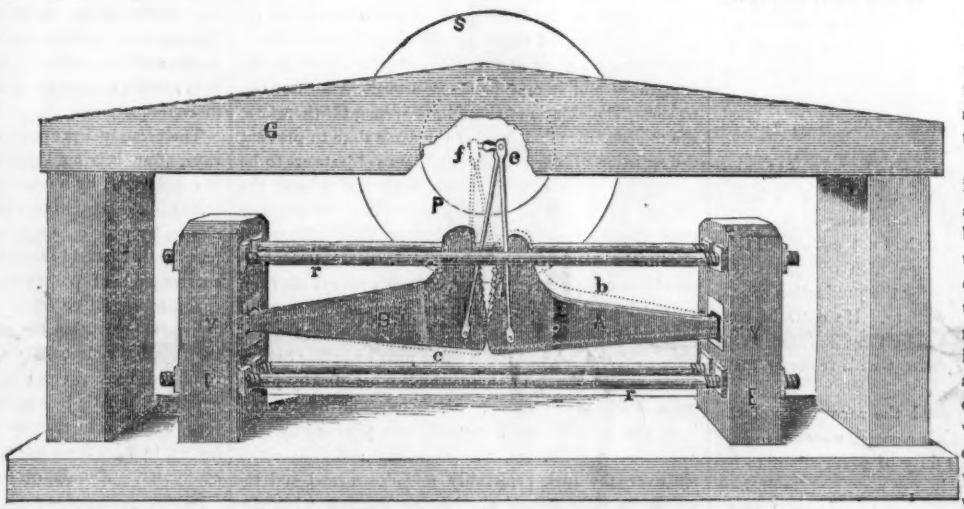
NEW YORK, MONDAY, DECEMBER 17, 1867.

$3 PER ANNUM
IN ADVANCE

The Cam Quartz Breaker and Pulverizer.

This machine combines all the power of the cam and eccentric in the most simple and effective way. The motion produced on the face of the cams is somewhat peculiar, as they have not only a crushing power as they converge, but they have a sliding and rubbing motion so much to be desired in crushing and pulverizing quartz.

In the accompanying engraving A B represent the two cams, with their fulcrums resting in the headblocks, E E, and their jaws being set close together by the tension bolts, *r*, *r*. These headblocks are best made of wood, making a great saving in transportation. The jaws are left uncovered by the lips, (the better to show the motion,) that are cast solid on each side of one of them, to retain the material while being crushed. P and S show the outlines of the driving-pulley and fly-wheel. G is a frame of wood to support the crank-shaft.



THE CAM QUARTZ BREAKER AND PULVERIZER.

The inner ends of the cams are connected to the crank, *e*, by four connecting-rods, two of which are only shown in the cut; the other two are on the opposite side of the cams. When the crank, *e*, is turned to the opposite centre, *f*, the jaws will have vibrated as shown by the dotted lines, *a*, *b*, thereby producing a rubbing or sliding motion, just in proportion to the throw of the crank. The power of this machine appears to be unlimited, as it may be increased indefinitely, simply by lengthening the cams and shortening the crank, which crank should not be more than three-fourths of an inch in any case.

The capacity for work is limited by the width of the jaws (which may be four inches or four feet), and the number of revolutions per minute, which should be about two hundred. The jaws are to be lined with moveable plates.

This machine has been operated with eminent satisfaction. Further information regarding this machine may be obtained at this office, or of the patentee, A. Hitchcock, 4 and 6 Pine-st., Room 19, N. Y.

Idaho Quartz Crusher.

It may be said that the gold-bearing quartz fields of this country are equal in area to our coal fields and iron districts. In fact, the quartz mountains are estimated by hundreds of square miles, and no one can say when or where these precious deposits will cease to be discovered.

Fortunately for the avarice of man, the quartz mountains refuse to give up their rich treasure, until they are torn down by the slow, but sure, mechanical genius of mind, and subjected to a pounding, grinding, crushing, washing, and sifting process, which, in a great measure, absorbs their intrinsic value.

Scientific men and mechanics are constantly racking their brains to invent some machine or chemical means by which to overcome the enormous expense of reducing these "everlasting hills" to impalpable powder, for by no other agency can the fine particles of the precious metal be disintegrated from their 'crystal home.'

Then it only follows, that the machine that is devised so as to produce the greatest per cent. on the capital and labor expended, is the one that every miner wants.

There are certain well known principles understood by all practical miners, with regard to the treatment of quartz. Perhaps the first machine ever invented to grind quartz, centuries ago, combines the very principles required in a higher degree than any modern invention; that is, not only a crushing power, but a certain amount of grinding and scouring motion is required in order to produce the largest yield; and this machine was a simple wheel, traveling round in a circular trough, turning on or driven by its axle, and operated by animal power.

IDAHO QUARTZ CRUSHER.

After many hundred years another wheel was added, making what is known in our country as the Chilian mill. This effected a gain of fifty per cent. in time; but there was a corresponding loss of power. Practical miners who have used them say that the Chilian mill will give a better yield of gold from a given quantity of quartz than any modern machine. The only objection to their use is that they are too slow for the age; so a system is now in vogue to half-pulverize a large quantity of quartz, and leave half or two-thirds of the yield in the tailings.

And it is also well understood by practical miners why the Chilian mill produces these results; it is because these principles of grinding and scouring are so eminently combined; for the simple breaking the quartz, as with a hammer, or between rollers, is not all that is required; the quartz must be pulverized and *scoured*, to brighten or clear the gold, so that it will amalgamate readily with the quicksilver.

It is usual for the wheel in a Chilian mill to weigh about two tons; this not being sufficient to crush the quartz in once passing over it, it must of necessity travel over the same material repeatedly before it is thoroughly pulverized; and herein is a great loss of time. If the wheels were heavy enough to crush the quartz in one revolution, a great saving would be made—precisely what has been done in the present machine. And now, after two thousand years of constant use, the THIRD wheel has been added to this most primitive of all machines, by which means a certain combination is secured, thus adding more than five-fold to its original capacity, showing the wonderful effect of simple combinations, turning a simple machine into a powerful engine of power.

The load or crushing power is placed on the top of the wheels, which are driven from their periphery, instead of from their centers, as in all cases heretofore, giving a great increase of crushing power to drive them of more than one hundred per cent; practically we have now a turn table with but three wheels.

By putting, say ten tons in the hopper, it creates a crushing power (including the weight of wheel) of about five tons per wheel. These mills may be used without any breaker by first breaking the rock to the size of McAdam stone, and it will grind to absolute impalpable powder from five to six tons per day by horse power.

The inventor feels confident that he can crush as much quartz, or at least produce as much gold per day, with two horses, as can be done with a battery of six stamps and a ten-horse power engine. Though the main object of the mill is for crushing quartz, the principle of it is applicable to various other kinds of work where grinding or crushing is required.

By referring to the cut it will be easily understood, when it is stated that the design is to use crushing wheels six feet in diameter, at the center of the tread.

Three other sizes are now being manufactured; one four and a half feet in diameter; one two and a half feet, and the smallest two feet in diameter.

A model of this machine can be seen at this office, and further information obtained.

On National Standards for Gas Measurement and Gas-Meters.

By GEORGE GLOVER, Esq.,

Formerly Lecturer on Natural Philosophy, Royal College of Surgeons, Edinburgh, and Vice-President Royal Scottish Society of Arts, and Superintending Medical Inspector General Board of Health, Whitehall.

From the London Journal of the Society of Arts, No. 424.

[CONCLUDED.]

Mr. Defries, as a manufacturer of meters with angular motion, justified that form of construction, on the ground that it did not carry condensation, but threw off the condensed matter, and deposited it at the base of the meter, where it could always be drawn off without disturbing the meter itself. The notion that the leather of the diaphragm was injuriously effected by the action of gas upon it was, he said, entirely erroneous.

Mr. Bishop, speaking only in the character of a gas consumer, expressed himself decidedly in favor of the dry meter.

The Chairman would now ask the meeting to accord their thanks to Mr. Glover for the very interesting paper he had read, and in doing so, he would for a moment consider the position in which this question had been placed before them. He took exception to one or two remarks made in the paper: First, as to the duty of the government in matters of this kind; and, in the next place, the statement that gas-works were not a nuisance to neighborhoods in which they were placed. As to the duty of the government, he dissented entirely from the view that it was the function of government to interfere with manufacturers of any kind, whether gas-meters or anything else.

It devolved upon the consumer to look after his own interests and to employ that meter which he believed to be most just to himself and to the company.

Mr. Glover explained that he had not advocated that the government should interfere with manufacturers, but should give every facility for the production of gas, as conducing to the public welfare. He entirely concurred in the views expressed by the Chairman, as to the non-interference of government with trade or manufacture.

The Chairman having quoted the paragraphs of the paper which had prompted his remark, went on to say, he did not hold it was the duty of government to interfere with manufacturers in any way, and he did not know how they could "protect and encourage" without some sort of interference. He believed the real interest of commerce and of the progress of invention in this country were dependent upon the fullest and most unfettered employment of ingenuity and capital, and that government protection or interference of any kind was an evil. As regarded gas-works, he could not agree that it was desirable they should be placed in the centres of great towns. True, the recent accident which occurred at one of these gas-works might have been prevented by proper precautions, but was there any accident which might not have been prevented by due and proper care? The question was, were not gas-works subject to special kinds of accidents, and in the present day ought such elements of danger to be placed in the centre of large populations? He contends that the sooner such evils be removed without injustice to those who had invested their capital in them the better. The paper opened the question as to which was the best instrument for measuring gas as it was delivered from the mains for the use of the consumer. He thought the relative merits of the wet and dry meter depended upon this. Which of the two instruments was composed of the most durable materials? In one case, they have the metallic mechanism working in water impregnated with ammonia, while the other meter was wholly dependent upon the durability and elasticity of the leather diaphragm. It appeared to him, taking the facts as they stood on both sides, looking also at what had fallen from the speaker, who was a manufacturer of both kinds of meters, and judging from experience, the evidence seemed certainly in favor of dry meters, as opposed to the wet, which required a very large amount of attention to secure accurate working. Without condemning the wet meter, which was was certainly a most ingenious instrument, he thought that when they looked at the admirable contrivances and beautiful workmanship which were introduced into the dry meters on the table before them, they must incline to the opinion that more permanent accuracy could be obtained by the latter instrument. He was sure they would feel that they were much indebted to Mr. Glover for the manner in which he had brought the subject under the notice of the Society, and he begged to purchase a cordial vote of thanks to the gentleman for this paper.

The vote of thanks was unanimously adopted.

Mr. Glover, in acknowledging the compliment, observed that he thought nothing had been said in the discussion to invalidate the statement in his paper.

Combustion of Fuel in Furnaces.

An improved apparatus for economizing and inducing more perfect combustion of fuel in furnaces has been invented and duly patented by Mr. Thomas Lancaster, of Bootle, England, engineer. In boiler and and other furnaces with fire-doors, grates, doors, and ash-pits of any of the ordinary kinds or arranged in any usual way, the combustion of the fuel therein is not at all satisfactorily accomplished, for not only does a considerable proportion of the sensible heat evolved pass up the chimney, but large quantities of black smoke, capable of giving out under proper treatment much heat, are conveyed away and discharged into the air, to the annoyance and it may be damage to the health of the public. The objects of these improvements, therefore, are to economize fuel, and at the same time to prevent the emission of black smoke, and these objects are to be accomplished by causing atmospheric air to enter the furnace by means of an apparatus which the inventor thus describes:—"Over the door of the furnace, and above the level of the fuel in the fire-grate, there is a curvilinear pipe or deflector, which conveys air from the outside of the furnace into and over the fuel therein, preferably in a downward, and toward the back direction. At the back of the furnace near or in the bridge there is a chamber, or there are chambers fed by pipes with air from the outside; this chamber or these chambers are provided with a curvilinear pipe or pipes, or deflector or deflectors, which convey and deliver the air over the fuel, preferably and downward and toward the door direction. In conjunction with the means or apparatus just described, I sometimes convey air into the furnace by openings at the sides of the door, and distribute it by perforated pipes or by small openings.—*Colliery Guardian, Sept. 15th.*

To Prevent Street Cars Running off the Track.

Dr. B. M. Esterle, of San Francisco, whose invention for raising carriage wheels out of railroad tracks, enabling them to cross the tracks or turn around on them, etc., having met with success, has brought out another valuable invention. It is a simple plan for preventing cars running off the track of street railroads and protecting the track against breaking or other injury by heavy trucks passing over it. Unlike most inventions in that line, it is an improvement on the rail itself, not on the wheels or couplings of the cars. It consists of slips of iron straight on one side and rounded off to a point at each end on the other, bolted to the surface of the rail on the inner edge. These slips are so arranged that the wheels on the opposite side of the car touch them alternately, and do not bear on both sides at once. If the fore or hind wheels of a car are off the track, drawing the car forward or backing it will bring them on again immediately, and it is impossible to get the whole four wheels off at once. In making new rails, the slips or projections mentioned could be made a part of the rail itself, the same as the flange now used. The invention would be of particular benefit at the abrupt curve at the corners of streets, where the cars are constantly getting off. The flange of the car wheel passes between the slips on the inner edge of the rail, and the flange or upper part of the rail, on which the weight of the car now runs.

On a Defect in the Demonstrating Polariscope, with a Simple and Effective Remedy.

BY J TRAILL TAYLOR.*

Having during the past winter been engaged in some experiments requiring the use of a polarizing lantern for projecting a disk of polarized light on a screen, I was struck with the inefficiency of even the best instrument for that purpose that I was able to procure. The one in question was constructed by Darker, and may be accepted as a type of the whole. By a simple deviation from the ordinary principle of construction, I have succeeded in producing a polarizing lantern, in which the light is so much more perfectly polarized as to permit objects to be projected on to a screen and exhibited under but little less illumination when a good Argand lamp is employed, than when (with the original lantern) a lime-light is used. The following description will explain both the defect alluded to and the improvement proposed.

When a lantern is fitted up in the usual way, to show the effects of polarization, the rays fall upon the polarizing plane; in this case a parcel of nine or ten plates of ordinary polished glass, inclined to the axis of the rays at the polarizing angle of 46°, in the form of a cone. Now, while the axial ray impinges on these plates at the correct angle of polarization, it naturally follows that no other portion of that cone of light can possibly do so, and consequently that the axial rays only are polarized, an immense loss of polarized light ensuing in consequence.

The remedy I propose consists in intercepting the rays, after leaving the condenser and before reaching the polarizer, by a concave flint lens, similar to that of the back portion of a photographic portrait combination, by which the whole mass of light, thus rendered parallel, is caused to impinge on the polarizer at the correct angle of polarization, and by which is also secured comparative freedom from the chromatic and spherical aberration caused by the condensers. After the rays are reflected from the polarizer, they are again rendered convergent by being transmitted through a small achromatic lens placed near the stage of the lantern, which also secures all the advantages so well known to arise from the employment of an achromatic condenser.—*Am. Journal of Photography.*

* Read before the British Association at Nottingham, 1866.

The Sphynx.

This new mystery, as exhibited by our showmen, appears as a head on what seems to be an ordinary three legged table, which stands in the centre of the stage. To all appearances, the head is an independent member, which makes a speech, and answers questions, quite as well as many an independent member in "another place." The secret lies in the table, which instead of being open underneath, is occupied by two mirrors, extending from the two back legs and meeting at the front leg. Now, if the spectator is ignorant of the existence of a mirror, he has no means of distinguishing reflected from real objects, unless they appear in unnatural positions. It is a law in optics that the reflected image of an object appears as far behind the mirror as the object reflected is in front of it. It is obvious that by a proper arrangement of duplicate pictures of that part of the scene hidden by the table a reflection of those duplicates may be caused to appear in the mirrors underneath the table, and thus lead the spectator to imagine that he sees beyond the table, whereas all the time he is looking at a reflected image of the back scene. The triangular space enclosed by the glasses serves to contain the leg and body of the Sphynx, whose head appears on top of the table.

—An experiment was recently made at Glen Haven, New-York, on nitro glycerine, as a blasting compound. Four different trials were made, with the greatest success. Sixteen ounces of the oil detached fifty tons of limestone rock from its bed and piled it up in fragments all around.

Hydro-Geology.

This new science—by which the hidden sources of water far beneath the surface of the earth can be accurately determined, not only as to depth, but quantity—is likely to create a great stir in the scientific world, if a tythe of the statements concerning it be true. The *Mercantile Journal* contains an interesting sketch on this subject, gathered from a review in the Paris *Monde*, from which it appears—hazel wands and divine rods aside—that among the first professors of this special science (including oil sources) was the Abbe Paramelle, who excited great attention to the subject by a paper read before the French Academy of Sciences in 1856. M. N. Flayosse, Chief Engineer and Professor of the Imperial Mining School, in a paper before the same academy in 1857, divided springs into two kinds; the superficial, which are caused by the filtration of rain through the surface soil arrested by an impermeable subsoil, and which must be looked for at the mouths of small valleys or ravines: and the deep springs in the "bony" formation of the earth, produced filtration of rain, the basin of which they may collect, and the system of their discharge. But the great professor of this new art is the Abbe Richard of Monticut, who at the last session of the academy presented a complete sketch of the principles which govern subterranean water deposits and water courses. We can only glance slishtly at the results of his success. He is now looked upon by multitudes as a kind of wizard, who can dry out water from the dry land by his wand. He is able to point out the spot, where, and at what depth a spring will be found, and how many gallons per minute it will yield. In a property near Cracow, in the very midst of three wells that had been sunk 40 metres, Richard indicated a spring at the depth of only four metres, which on the morning yielded an abundance of pure water. At Burkeburgh, in Germany, a boring suggested by him in 1863, has raised from a depth of 90 metres a jet of water that throws off 35 litres per day. Multitudes of similar examples are given throughout Europe. In 1855 he pointed out a large number of oil wells, and is now exploring a portion of an eastern portion of France for this liquid. How far the romantic statements made are founded in fact we cannot say; but certainly this subject of hydro-geology is one of singular importance to our mining regions, and time spent in its study will be well spent.

An Iron Mountain in Sweden.

Sweden, which has long produced some of the best iron in the world, has also its "iron mountain" as well as America. Indeed, the iron mountain of Sweden is both larger and richer than that of Missouri. Its ore yields 72 per cent. of metallic iron, somewhat higher, we believe, than the American iron mountain. The first indication which the traveler has of his approach to this mountain is the fact of the unreliability of his compass, which becomes useless for two or three days before reaching it, over the slowly traveled mountain road. Mr. Gladstone, the English statesman, in describing his visit to the locality, says that upon his party arriving at the foot of the mountain, they 'walked for hours and hours upon nothing but masses of iron ore, *perfectly bright like steel.*' We are inclined to think the distinguished traveler in the above quoted remark, have slightly exaggerated what he saw; else the climate there must be so very peculiar that its atmosphere will not exert its usual oxydizing influences upon a metal so sensitive of moisture as iron. The mountain is no doubt very similar in appearance to our "Pilot Knob:" but it has the great drawback of being situated in a very high latitude, in Swedish Lapland, some one or two degrees above the head of the Gulf of Bothnia, and just within the Arctic Circle. Measures are being taken, however, to overcome the natural obstacles against the development of this wonderful mineral production, by constructing a railroad to connect it with tide water. In time, no doubt, the Pilot Knob of Sweden will be to the Old World, what the Pilot Knob of Missouri is to the New World. Each can supply its respective continent with all the iron that will be wanted for many centuries to come. Both may be considered as among the great natural wonders of the world.

The Process of Roasting Ores.

Translated from the German of F. Plattner, for the Mining & Petroleum Standard and Am. Gas-Light Journal, by

B. Examples of the deportment of many ores and Mill products, when roasted in lump, either in "Free Heaps" or in Kilns.

[Entered according to an Act of Congress, in the year 1866, by Bryant, Callender & Co., in the Clerks Office of the District Court of the United States, for the Southern District of New-York.]

J. H. TIEMANN.

NUMBER VII.

The formation of sulphates, antimonates and free metal oxides also occurs, when the ores or mill products in lump, are roasted in "free heaps," kilns, or shaft furnaces, instead of pulverized in reverbarotory furnaces, etc. Ores or mill products subjected to this kind of roasting, with the exception of iron ores which are to be afterwards smelted to a matt, consist principally of compounds or mixtures of different sulphur metals, or compounds of arsenical metals alone. For the most part (especially where there is a large proportion of sulphide of iron,) free metal oxides are formed, together with more or less sulphates, arsenates and antimonates, and under certain circumstances pure metal separates.

With the oxides, the following sulphates are principally formed:

1. Protosulphate of iron, which is formed at a low temperature, upon the heat being afterwards increased, this decomposes to a persulphate, and then entirely, or if the heat was not sufficient. partly to the sesquixoyd.

2. Sulphate of copper, which at a higher heat decomposes to free oxyd, or under certain circumstances, which will be noticed further on, to metallic copper.

3. Sulphate of lead. which at a higher heat, in the absence of reducing substances, remains the same, and is found as such after the roasting.

4. Sulphate of Zinc, which only at a very high temperature is resolved partly into free oxyd, but for the greater part remains as a basic sulphate.

5. Sulphate of Manganese, which only at a very high temperature is reduced to the red oxyd, remains for the most part unchanged; and finally,

6. Sulphate of Silver, which however appears to be formed only in those cases where the sulphates of the other metals are decomposed in such a manner that the greater part of the sulphuric acid escapes undecomposed, and acts directly on the metallic silver which has been formed from the sulphide.

The arsenates formed in connection with the free oxides are

1. Basic Arsenate of Nickel and Cohalt, when ores or mill oroduets containing these metals in combination with arsenic, are roasted: and

2. Basic Arsenate of Iron, as when matt rich in iron is roasted.

The following Antimonates may be formed in connection with the oxydes:

1. Antimonate of Lead, when the substance contains sulphide of antimony with sulphide of lead.

2. Antimonate of Copper, when the copper ore or matt contains sulphide of antimony; and

3. Antimonate of Silver, when the ore or product contains sulphide or even metallic antimony.

The separation of non-volatile metals, as such, for instance, copper, as a rule, only occurs when the roasting of the lump ore in kilns is repeated three or four times, and a mutual decomposition of free oxides and sulphur metals takes place, in which case sulphurous acid is given off, and the free metal separates from the oxides, as well as from the sulphides. Silver sometimes separates in metallic state; principally, however, only in such cases where the other sulphur metals in combination with it, are at a lower stage of sulphurization and free from any perceptible amount of arsenic and antimony. If, however, sulphates are formed at the same time, which are decomposed at a higher temperature, the sulphuric acid, as in the roasting of *pulverized* silver ores and products in the reverbaratory furnace, seems to act on the silver and convert it into a sulphate. Quicksilver in combination with sulphur, when roasted, separates as metal under all circumstances, as soon as the sulphur has been converted into sulphurous acid by the oxygen of the air, or when it has been taken up by some body for which it has a greater affinity.

III. The causes of the formation of sulphuric, arsenic and antimony acids, and of arsenates, sulphates, antimonates and free oxides, when pulverized ores and products are roasted in a reverberatory furnace, and of the sometimes occurring loss of gold and silver.

A. Concerning the formation and deportment of sulphuric acid, sulphates and free oxides, in roasting pulverized ores and products, and the accompanying loss of gold and silver.

According to the foregoing examples, 1 to 11, the probability seems indeed to be, that when sulphur metals are roasted with admission of air, sulphuric acid is formed directly; but if we remember that sulphur burns in the air (consisting of 210 parts oxygen, 970 parts nitrous oxyd, and containing in 1,000 parts 2 to 4 parts of carbonic acid, with varying proportions of hydrogen,) at a temperature of 260° Cels., as well as in pure oxygen to sulphurous acid only, and also that a gaseous mixture of sulphurous acid and oxygen, or atmospheric air, when passed through a heated glass or porcelain tube, is not converted into sulphuric acid, but on the contrary, fumes of anhydrous sulphuric acid when treated in the same manner, are decomposed to sulphurous acid and oxygen; we must therefore presume that the formation of sulphuric acid, and consequent formation of sulphates, in the roasting of different sulphur metals, is attributable to some other cause.*

[a.] Experiments on the formation of sulphuric acid and sulphates, by combining gaseous sulphurous acid with oxygen of the air, in con act with solid substances.

For a proper experiment we must start with the well known fact in chemistry, "that the inclination of two gaseous bodies to form a combination, is often excited by contact with a solid," and remember, that as has been proven by many well known chemists, a mixture of sulphurous acid gas and oxygen, or atmospheric air in proper proportions, when led through a heated glass or porcelain tube, tends only then to form sulphuric acid, when the tube contains a solid body, in the form of powder or as a porous mass; as, for instance, finely divided platina (sponge platina or platina wire wound spirally,) coarsely powdered pummice stone, certain metallic oxides, and even lime, (which changes to gypsum) that portion of the tube containing the substance being heated only. It appears, therefore, not at all improbable, that in roasting ores and mill products, consisting chiefly of sulphur metals, the sulphuric acid is formed in a similar manner.

* Although in chemistry we know that sulphur and oxygen may combine in seven different proportions, as follows:

1. Sulphuric Acid S O3.	4. Hyposulphurous Acid S2 O2.
2. Sulphurous Acid S O2.	5. Trithionic Acid S3 O5.
3. Hyposulphuric Acid S2 O5.	6. Tetratheonic Acid S4 O5.
	7. Pentatheonic Acid S5 O5.

yet in roasting only the first two, sulphuric and sulphurous are taken into account, because at a high temperature the others are decomposed to sulphur and sulphurous acid (the hyposulphuric sometimes partly to sulphuric) and therefore cannot be formed in the roasting of sulphur metals.

[Editors of Journals may copy these articles by giving proper credit, and marking the same as copyrighted. Eds.]

New Mode of Sawing Stone.—Instead of the saw ordinarily employed, a disc of lead, kept well covered with emery, has been used for some time in France, with great success and economy. The lead is cast on a circular plate of cast iron, of sufficient thickness and diameter, and pierced with holes, which by means of the lead with which they become filled in the casting, unite together strongly the thin sheets of lead at its two sides, which are joined also at the circumference of the disc. The emery falls from a reservoir above the disc, and the surplus is conveyed into a trough underneath, whence it is brought back to the vessel which feeds the disc. This apparatus is either moved on a carriage to the rock which is to be cut, or the block of stone is brought up to it on a carriage. A saw of this description, about 3 ft. 6 in. in diameter, driven by a 4-horse power, was found to move through Carrara marble at the rate of about 2¼ inches per minute, and through Normandy granite at the rate of nearly an inch in the same time; and the cost of cutting was scarcely the one-sixth of that with the ordinary method, —*Scientific Review.*

Economy of Heat and Consumption of Smoke—Manufacture of Steel.

Among recent and valuable inventions the furnace of Mr. Liemens, of England, which has excited great interest in Great Britain, where the presumed dearth of mineral fuel has been regarded with apprehension. This invention, however, lays all such apprehension at rest, for it literally economizes all the fuel and all the heat, and gives no smoke. It has a gas producer, standing apart, in which the coal approaches the fire-place by an inclined plane, where it is heated gradually, and parts with all its volatile products which pass through the fire.

The fuel itself is slowly consumed; the carbonic acid —an incombustible gas—is converted into combustible carbonic oxide by passing through the thick layer of red hot coal. Then below the grate a cistern of water gives off steam, and each cubic foot of this steam, as it rises and passes through the fire is decomposed into double that quantity of hydrogen and carbonic oxide, which being inflamable, increases the temperature. The whole of the heat products travel through the furnace, and enter one of four chambers, or regenerators, as Mr. Liemens calls them, which are built in the lower part of the structure. These four are used alternately; whilst one heats another cools and the reverse. They intercept the heat, which otherwise would fly from the chimney in waste; and after passing through the gas and air reach the heating chamber at nearly the heat of that chamber itself; a heat so intense that, unless modified, it would fuse the furnace and everything exposed to its action. No smoke escapes; the heat in the chimney is seldom sufficient to singe wood; and the saving of fuel compared with an ordinary furnace from 40 to 50 per cent.

For glass houses, steel smelters, manufacturers of iron, or any trade or process in which intense heat is required the Liemens' furnace is essentially suitable. As it economized all the heat derivable from the combustion of the fuel—50 or 60 per cent. of which is now lost—it is not likely to be superseded in our day. The yearly saving by means of this furnace is far more than its cost.

Mr. Liemens has lately established a steel melting furnace on his own account at Birmingham, with perfect success. It heats fourteen melting pots and a muffle, each pot averaging 45 pounds of mill steel. There are six casts every twenty-four hours, so that the daily production is 3789 pounds. The gas producer is in use, and the consumption of small coal at 6s. a ton, is 1¼ tons per day, about 18cts. only per ton of steel. To do the same work under the system of heating furnaces in Sheffield, 3 ½ tons of coke, at 25s. per ton, are required, the saving being thus upward of £4 per ton for fuel alone. This furnace is also in extensive use for reheating steel elsewhere.—*London Mining Journal.*

Photographing Cannon Balls.

The London British *Journal of Photography* gives a very interesting account of some experiments in the photographing of guns while being fired. In the pictures which were taken, the moment had been so exactly seized that the ball could actually be seen protruding from the muzzle of the gun, while, as we might say, in the very act of leaving it. A description of the mechanism by means of which this exactness was secured, will be interesting. It will of course be evident that no person, however delicate his perception, could act with sufficient quickness to expose the plate at the exact instant desired. It could only be done by means of electricity. A stereoscopic camera is arranged with a disk in front of the lenses, revolving on its axis. This disk has two holes in it, either of which can be made, by its revolution, to correspond with the line of the lenses. A circular spring is so attached to the disk, that when set free it will make a half revolution with the quickness of a flash, thereby bringing one of the holes in a line with the lenses and admitting the light for an instant. Now for the manner in which the disc is set free. First, the disk is "wound up," so that the spring referred to is at its utmost tension. It is retained in this position by means of a catch and trigger, which latter is connected with an electro-magnet. The gun is fired by means of a tube containing gunpowder, and through which runs a delicate platinum wire. When a galvanic "shock" is sent through this wire, it instantly becomes red hot and melts. Two things are by this accomplished simultaneously; first, a current of electricity is transmitted which vivifies the electro-magnet and causes it to attract the trigger, thereby releasing the disk: and second, the powder is ignited and the gun discharged. In order that the aperture in the disk should be retained in a line with tho lenses until the powder is fairly ignited, a stop holds it in that position until the wire melts. At thas instant the continuity being broken, the electro-magnet ceases to act, nothing prevents the continued action of the spring, and the disk is carried round far enough to close the camera. The manner by which these two movements, so nearly consentaneous without being exactly so, are thus effected, is exquisitely ingenious.

Steel Gun Barrels.

It has long been a desideratum that some economical method of manufacturing gun barrels of steel should be devised. The only method worthy of note heretofore, has been that of forging the solid bar, and then boring it. This is slow work, and can only be done by machinery which moves with great nicety. A new process has been recently patented in England by Messrs. Deaken & Johnson, which bids fair to be a success. A brief description of it, taken from the London *Colliery Guardian* of September 15th, is here quoted:

"A round bar of Bessemer steel is cut into lengths, which are heated in an ordinary furnace. The short round block is then put under a vertical punch of considerable power, which is worked by steam, and a hole punched through it—an operation which requires only a few seconds. The perforated block is allowed to cool, and is then carefully examined to see if any cracks appear on the outer surface. The expansive force required to pierce a hole through a solid lump of steel necessarily subjects its outer particles to a severe strain, and is sure to develop any inherent defect, whether arising from faults in the material, or unskillful workmanship. Should any external cracks appear, they are carefully cut out with a chisel if shallow, and if they penetrate deeply the block is rejected. Thus the first operation applies a most severe test to the metal. A piece of steel which can sustain without a flaw a force sufficient to punch a hole through it, will not give way from the explosion of any charge of powder to which as a gun barrel it can ever be submitted. The steel barrel having thus been perforated requires only elongation and reduction in thickness. This is effected by heating it through a succession of grooved rolls, with a mandrill in the hollow of the tube, when it is ready for the lathe."

All attempts to produce a good barrel by casting have failed. The welding of steel is a nice operation, and on a large scale cannot be depended upon. By the process above described, a perfect barrel can, it is said, be produced at a cost not exceeding that of an ordinary welded iron one.

Oxidation by Air.

Mr. James Hargreaves, of Widnes, England, has recently devised an apparatus for the oxidation by air alone of bodies dissolved in water, which constitutes a novel and very ingenious application of the injector principle. It was devised for use in the soda manufacture, for the oxidation into sulphate of sulphide of sodium contained in the complex solution obtained by the lixiviation of "black ash." This oxidation had previously been effected by means of nitrate of sodium, which is a very costly material, the necessity for the use of which, for the purpose in question, Mr. Hargreaves contrivance entirely obviates. Mr. Hargreaves puts the crude liquor into a vessel furnished with a false bottom, which false bottom is perforated with numerous small holes, and has inserted in it, at its centre, the lower end of a pipe which passes up to a little above the top of the vessel, and terminates at its upper end in a throat, immediately above which is fixed a jet connected with a boiler, the steam in which should be kept at a pressure of about 40 lbs. per square inch. Steam from this jet rushes into the funnel-shaped throat and then down the pipe, carrying with it into the space between the bottom of the vessel and the false bottom very large quantities of air, which then issue through the holes in the false bottom and rise through the solution, "causing," says Mr. Hargreaves, "an intense commotion," and coming into contact with so large a surface of the solution as very rapidly to oxidize all oxidizable matters contained in it. The heat communicated to the solution by the steam greatly facilitates this process of oxidation. Mr. Hargreaves states that a large charge of crude soda solution may have all the sulphide in it completely oxidized by this method in from four to five hours.—*Mechanics Magazine.*

Brevities.

—A telegraphic short-hand has been invented by Captain Bolton, an Englishman.

—Two tons of marble were sent to San Francisco from one quarry in Columbia, during the last month.

—A mining company in Louisiana has struck a solid block of pure lead, estimated to weigh thirty-three tons.

—Man cannot distinguish a space of time that may be less than than the tenth part of a second.

—One hundred and twenty millions of steel pens are yearly made at the "Victoria Works," Birmingham, England.

—The railway between Calcutta and Bombay is about one thousand miles long, and is traversed by trains in about four days.

—The presence of alcohol in etherial oils may be detected by fuchsin, which is soluble in alcohol, but not in etherial oils.

—Superheated Steam, for the purpose of navigation and motive power, was first patented by Trevethick in 1833.

—With four weights of respectively one pound, three pounds, nine and twenty-seven pounds, any number of pounds from one to forty may be weighed.

—It is said that sands which are used as a filter for the purification of water, are only effective when they contain the black oxyd of iron or magnetic carbide.

—The entire privilege of "sticking bills" on the inside and outside of the Paris Exhibition building, has been sold for half a million of francs.

—Thermo-electric currents can be produced by *percussion* as well as by *friction*. This has been demonstrated by Prof. O. N. Rood, of Columbia College.

—A single ounce of gunpowder, placed at an angle of forty-five degrees, is capable of projecting a 24-lb. cannon ball a distance of three hundred yards.

Useful Recipes.

Rust on Iron—Paint.—Every particle of rust on iron may be removed by first softening it with petroleum and then rubbing well with coarse sand-paper. To paint iron, take lamp-black sufficient for two coats, and mix with equal quantities of Japan varnish and boiled linseed oil.

Bronzing.—The following is a good method of bronzing tin castings. When clean, wash them with a mixture of one part each of sulphate of copper, and sulphate of iron in twenty parts of water; dry and wash again with distilled vinegar eleven parts. When dry polish with colcothar.

—Cracks in furniture may be advantageously filled by the following composition: Moisten a piece of recently burned lime with enough water to make it fall into powder, mix one part of this slacked lime with two parts of rye flour, and a sufficient quantity of boiled linseed oil to form it into a thick, plastic mass.

Water-Proof Packing Paper.—The following is a German Recipe, Dissolve 680.3 grammas (about 1.82 lbs.) of white soap in a quart of water. In another quart of water dissolve 1.82 oz. troy of gumarabic and 5.5 ozs glue. Mix the two solutions, warm them, and soak the paper in the liquid. Pass it between rollers, or simply hang it up to drip, and then only at a gentle temperature.

Correspondence.

Plastic Slate.

NEW-YORK, Nov. 16, 1866.

TO AMERICAN GAS-LIGHT JOURNAL.

We have a long communication asking questions and making assertions respecting the durability of a mastic made of coal tar and sand. His question is, "If coal tar will hold the particles of slate together, why will it not also hold particles of sand together? It surely will.

ANSWER.

This is a fair question, but like many other questions it may be easier asked than answered. An intelligent or philosophical answer may require a knowledge of some of the laws of synthetical chemistry that have not yet been revealed to men. Of many a thing we can say IT IS, while we cannot show why or how it is.

The body of one of my neighbors was buried in the public cemetery, was taken up seven or eight years afterwards, and was changed to solid heavy stone, weighing fifty per cent. more than the living body? Other bodies in the same ground had decayed and turned to dust. Some kinds of wood placed in water possessing certain properties, petrify and become unchangable stone—other wood or other water would produce no such result. In these cases we say there is an aptitude in the body or the wood, to receive the matter contained in the ground or the water. Scientific men will talk to you about affinities, attractions, &c. &c., but the hone maker has found the conditions in which the transformation takes place, and cares very little about the natural laws that effect it. They may all "creek" to him and yet he can, and does produce good hones.

But we will answer our friend's sylogim by the yankee method. His position is, coal tar holds the particles of slate together in a solid mass, *ergo*—coal tar will hold sand together in a solid mass. Let us see—Here is water and plaster (gypsum) put them together—there is your plaster held together by the water in a solid mass.

Ergo.—Water will hold sand in a solid mass. That is a good syllogism—but it is *not a good fact.* Again, water and flour of wheat make a solid *when dry*—*ergo*, water and sand will make a solid when dry! Again, water and lime produce a solid substance, and will take in a quantity of sand, and still remain hard, *if kept dry*, but what becomes of it when water enters the mass again? In all these cases the element that unites them also separate them. But oil or coal tar repel water for a time and hence the sand is held together, but no union of the particles of sand themselves is formed, and when the coal tar is exhausted by evaporation, you will have *sand* not *sand stone.* Sand with coal tar has been on trial by one after another these ten years, and as fast as one theorist abandons it, another will take it up as a "new discovery"! Some mix lime with it, some try ashes with it, but both these dissolve the oil of the tar, (the latter making it into soap) and hasten the disintegration.

But whatever may be the law that governs the reconstruction of solid slate stone from its particles, the fact stands out indisputably, and as firm as that great oak tree which was certainly once an insignificant acorn. And the union of the particles having fairly begun, the element that held them in juxta-position cannot separate them again. They reject its interference and cleave to each other even though thrown into the red hot fire and every particle of the tar burned out, they still refuse to separate, but cling to each other by the slightest possible contact with a tenacity truly wonderful.

X.

At a meeting of the Farmer's Club, held Tuesday December 4th, the following formed part of the proceedings:

CISTERNS—CEMENT OR SLATE—James M. Allen, New-York—"I am interested in selling slate flour. It is a patented article, and of course the more there is sold for any purpose the better for the patentees. In one of your late reports you told James G. Shattuck, Linn Creek, Mo., how to make a cistern with plastic slate. But why use slate for a cistern? Is not water lime cement good enough and cheap enough?

You say: "The coal tar must be boiled before mixing the slate, else it will not harden under ground or under water. That is right for cisterns or cellers, but for posts and timbers, or iron in the ground or water,, I would as soon have it soft as hard. Of course it will adhere and harden a little, and in twenty years may become quite hard in the ground. In making a fence of boards or pickets, I would apply the mastic, as I put up the fence, to all joints or laps, and afterward paint the whole, even the tops of the posts, using it raw.

Plastic slate, when made with coal tar, does not take paint kindly, but the slate flour can be mixed with linseed oil and make an excellent paint of the natural color of the slate rock, and then it can be covered with a coat of any other colored paint. With oil, however, the slate flour does not form that remarkable firm, adhesive compound, known as plastic slate, when properly mixed with coal tar. Then for roofs, or for fence posts and timber, or in the ground or water, I am sure it has no equal, whether the posts be of wood or iron, they equally defy decay. It keeps out water, air and insects. The Toredo, which destroys wood in salt water, is completely shut out with plastic slate. It is beginning to be used with entire success in lieu of copper upon ship bottoms, and to preserve piles and dock timbers. It is also proposed to use it to preserve the iron slabs which are to be placed at the graves of our dead heroes. It has almost innumerable purposes of great value, without applying it to any doubtful ones, or for building cisterns, where water-lime is good enough and cheap enough. Three barrels will make a cistern large enough for a family of twenty persons.

S. B. June, Brandon, Vt, says: "Please inform us in what respects the plastic slate roofing is better than coal tar and gravel."

To which the club reply, we will try.

Both, when new, are perfect roofs. For gravel the tar is boiled, so that it will be hard when cold. Of course, a coat of pitch over a roof is water-proof. But as it will melt and run off, the gravel is put into the hot pitch, as it is spread upon the roof, to make it stay where it is put. Of course, this kind of roofing cannot be used upon a steep pitch. Plastic slate can. Roofs are much easier made with it than gravel, for that is often difficult to obtain. Boiling the tar is troublesome, dangerous business. There is no affinity between gravel and coal tar. There is between slate flour and tar. It forms slate—reconstructed, solid slate. All experiments to form stone with tar and clay, sand, plaster, lime, coal-dust—everything but slate flour have failed Time crumbles them, while the same agencies make plastic slate harder and harder year aftea year.

That is why it is better than tar and gravel. Are you satisfied? Don't ask us *why* this mixture turns to stone. If you do we shall answer: "Why does one piece of wood petrify and another not? Why have human bodies turned to stone where thousands of others have turned to dust?"

The fact is the slate flour and tar properly mixed does turn to stone, and other mixtures do not. It does make a good roof, impervious to air and water, proof against sparks of fire, is durable, cheap, and obtainable everywhere. One of the best buildings ever erected in the city of Boston is covered with the roofing, and so are some of the best new buildings in and aroundt New-York, and a ship has recently sailed from this por. with plastic slate in place of copper on her bottom That is why it is better than gravel.

Mining Items.

MINING IN PLACER COUNTY, CALIFORNIA.—The Stanford ledge is the name of a claim now being opened about one mile below town. A shaft has been sunk on it twenty-eight feet, at which depth the vein is found to be two and a half feet wide, with solid granite casings. The rock prospects well in free gold, and is highly impregnated with sulphurets.

MORE COPPER.—A rich lead of copper ore has been discovered by Mr. Mish, in Santa Cruz County, Cal. It is situated about one mile south-east of the Forest House, near the stage road, on the northern slope of the high mountain known as the Loami Prieta spur.

MINING DIVIDENDS.—The Yellow Jacket Silver Mining Company has declared a dividend of $50 a foot, the Savage a dividend of $75 a foot, and the Empire Mill and Mining Company a dividend of $6 per share, or $96 per foot.

MORE RICH MINES DISCOVERED IN NEVADA COUNTY.—The *Nevada Transcript* of Nov. 1st says:—"The rich strikes being made in gravel claims remind one of the good old days of '49, when a pan of dirt was good for a week's board. At Rocky Bar, near Fall Creek, Little York, and in other localities in the country, cement and gravel claims of great richnees have been struck during the past six months. Another new district of immense richness has just been opened near the Cascades on Deer Creek. Last Spring the range from the south side of Deer Creek to Quaker Hill was located, and a number of companies commenced prospecting for the gravel channel which was supposed to have been hidden there. Regan & Spayth sunk a shaft and struck gravel, but the water prevented them from prospecting more than a few feet. They then commenced a tunnel and after running a distance of eighty feet, a short time since they struck the channel, which is loose gravel and very wet, supplying enough water to wash the drift dirt. The deposit is nine feet in depth and prospects immensely from top to bed of rock. From four pans of dirt they took $38, some of the lumps being worth $4."

NEVADA.—WASHOE—The Virginia *Union* says: The streak of rich ore in the Gould & Curry has widened to two feet. It is of a soft, decomposed nature, rich in silver sulphurets, and will yield $80 or more to the ton; being more like gravel than rock, it is mined out with the greatest facility, and is sacked up for milling. This rich ore is found about 500 feet south-west of the Bonner shaft, and some 500 feet below the level of D-st. The expense of running the Gould & Curry mill for the month of August, was $56,860; the number of tons of ore crushed was 3,135, at a cost of $11.73 per ton; the rock assayed $53.40 per ton; the amount of bullion returned was valued at $102,506.18 .....The Savage Mining Company has declared a dividend of $75 a foot and carried over quite a surplus towards next month's dividend.....The Yellow Jacket declared a dividend of $50 per foot.

The Gold Hill *News* of Oct. 1st, says: There was shipped by Wells, Fargo & Co., from their Gold Hill office, Nevada, during the month of August, $700,940,-42. About a hundred thousand dollars of the product of the Gold Hill mines, besides the above, was shipped from Virginia City.

New Inventions and Ideas.

—A new process for manufacturing lucifer matches has been brought before the French Academy. The wooden slips are first plunged into phosphorous and afterwards into sulphur—the old method reversed.

—An improvement in smelting iron has been made in the foundry of the Philadelphia Navy Yard. By this improvement, where it occupied before three hours in smelting a few hundred pounds of iron, it is now accomplished in one hour.

—M. Bazin, a French artist, takes photographs of sunken vessels by means of a strong sheet iron box with thick glass windows which he calls his "photographic chamber," and with the aid of a powerful electric light.

—An artificial ivory is made in France by M. Dupre, from a paste of papier-mache and gelatine. Billiard balls of this material can be thrown from the top of a house to the pavement without injury. "Parisian Marble" is the name given to it.

—M. Boutet, a French engineer, has suggested still another plan for connecting France with England. It is a bridge 22 miles long, and 214 feet wide, with openings for ships, and paths for passengers on each side. The cost is estimated at $80,000,000.

SAFETY POCKET.—James T. Chambers, Utica, N. Y.: This invention consists in so constructing a pocket that a watch or any other article placed in it cannot be abstracted without the knowledge of the possessor or wearer.

A NEW METHOD TO AVOID BOILER INCRUSTATION.—An apparatus has been invented to prevent the incrustation of boilers, which is certified to have perfectly succeeded. It proceeds upon the principle of the inversion of the galvano-plastic process, in which metals are made to adhere on proper surfaces, by deposit from the solution. In this arrangement the galvanic effect is repellant, and prevents the adhesion of particles.

HARD IRON.—M. Gaudin has found that by adding to ordinary cast-iron, in fusion, phosphate of iron and peroxyd of manganese, in certain proportions, he obtained a product of exceeding hardness. The resulting metal cannot be forged, but casts easily, and is, moreover, singularly sonorous; and he proposes it as a material for bells. He finds also, that a still harder metal is produced by the addition of tungsten to ordinary cast-iron. Crystals of it will cut glass as readily as the diamond.

MORRIS, TASKER & CO.,

PASCAL IRON WORKS

[ESTABLISHED 1821.]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

J. VAUGHAN MERRICK, W. H. MERRICK,
JOHN E. CORE.

SOUTHWARK FOUNDRY,

FIFTH & WASHINGTON STREETS,

PHILADELPHIA.

MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam of Hand Air Pumps for providing Street Mains, Centre Seals, Governors, Wrought or Cast-Iron, Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.

Address— MERRICK & SONS,
5th and Washington Sts, Philadelphia.

S. FULTON & CO.,

(Successors to Colwell & Co.)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

SAMUEL FULTON, THEO. TREWENDT

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its branches

561 Broadway,
NEW YORK.

WOODEN PURIFYING TRAYS
PATENT
Conically Slotted Solid Wood Sieves
FOR PURIFIERS.

The Conically Slotted Solid Wood Tray or sieve was patented 21st October, 1862, and all persons are cautioned against purchasing them of any other person except the subscriber. The following companies are now using these trays.

Manhattan, New York,
Metropolitan,
New York
Albany
Troy
Brooklyn, L. I.
Williamsburgh,
Citizens
Baltimore Md.
Louisville, Ky.
Chicago, Ill
Cambridge,
And numerous others

Orders received by mail or otherwise.

JOHN L CHEESMAN.
147 Avenue C New York City

JOSEPH LENNIG,

1615, 1617, and 1619 Francis St.,

Above Ridge Avenue, Philadelphia, Pa.,

MANUFACTURER OF

Wet and Dry Gas Meters,

STATION, SHOW, & EXPERIMENTAL METERS,

Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.

GAS APPARATUS

Of the most reliable and approved construction manufactured and on hand at the

UNION GAS METER WORKS.

D. PARRISH, Jr.,

GAS ENGINEER

And Contractor for Coal or Oil Gas-Works.

Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.

205 1-2 Walnut st., Philadelphia, Pa.

Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

THE AUBIN BALLANCED

VALVE WATER METER,

(Used also for Oils and Liquors)

Is now in use by many City Water Cos., because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
No. 40 Cortland street,

R. D. WOOD & CO.,

MANUFACTURERS OF

CAST-IRON PIPE, RETORTS, &c.

Office, 400 Chestnut Street,
PHILADELPHIA.

Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather to the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbers.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,

COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

GAS-BURNERS.

WIGHTMAN BROS.,

IMPORTERS AND

SOLE AGENTS

For the United States and Canada, of

SCHWARZ'S

GERMAN LAVA GAS-TIPS

And proprietors of Winchester's Improved

LAVA TIP GAS BURNERS,

No. 25 Kilby Street,

BOSTON, MASS.

T. G. ARNOLD,

MANUFACTURER OF

GAS-BURNERS

And Importer of SCOTCH TIPS,

224 and 226 West 21st street,

formerly No. 447 BROOME ST., New York.

Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,

Manufacturer of

GAS-BURNERS,

For Lighting and Heating Purposes.

GAS HEATING AND COOKING APPARATUS; FITTERS' ROVING APPARATUS, &c.

529 Commerce st., bet. Market & Arch, Philadelphia

JOSEPH LEES,

Sole Agent for the sale of

Thompson's Gas Controller

In the States of

CALIFORNIA AND OREGON,

San Francisco, Cal.

Carrington & Co.'s
GENERAL
PURCHASING
AGENCY,
In Connection with all the Expresses
No. 30 Broadway,
NEW YORK.

Established 1854.

Purchases to order any article wanted from New York or Europe, for ladies' or gentlemen's use or wear,---comfort or luxury,---from a cameo to a cashmer, a seal ring to a steam engine.

Goods purchased at current City prices, and forwarded by Express or as directed.

Commission, Five Per Cent

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

THE HAVANA
MEXICAN & BRAZILIAN
EXPRESS.

CARRINGTON & CO.
30 Broadway.

Express for HAVANA and ISLAND OF CUBA by regular steamships weekly.

Express for MEXICO and VERA CRUZ on the 10th and 16th of every month.

Express for ST. THOMAS, BAHIA, and RIO DE JANEIRO each month.

Packages received for United States Brazil Squadron.

Freights should be sent to our office day before sailing of steamer, with invoice, contents and value.

FINKLE & LYON'S
New Family
SEWING MACHINE
Should be known in
IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the FINKLE & LYON FAMILY SEWING MACHINE to any other, he can return it and have back his money.

This machine has taken many of the HIGHEST PRIZES; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

Our new Manufacturing Machine is sold on the same terms as the Family Machine.

Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.
No. 561 BROADWAY, NEW YORK.

Gas Fixtures and House Furnishing GOODS,

E. V. HAUGHWOUT & CO.,

488, 490 and 492 Broadway.

Corner of Broome street, New York,

Mannfacturers and dealers in

CHANDELIERS & GAS FIXTURES

Have a large and very choice assortment of GAS FIXTURES, which they offer at reduced pri ces, in view of the recent fall in gold. Their

Glass and Fire Gilt Chandeliers, are of entirely new designs,

And well worthy of attention by those who wish to purchase

☞ *Fine Fixtures for their Houses.*

OFFICE OF WM. DAVIDSON,
INSPECTOR OF GAS METERS FOR THE STATE OF NEW YORK.

☞At the above address.

Architectural Iron Works,

13th and 14th streets, near Avenue C.

BRANCH OFFICE 42 DUANE ST.,
NEW YORK.

OFFICERS: { D. D. Badger, President. N. Cheney, Vice Pres. & Act. Tr. C. C. Gordon, Secretary Pro Tem.

PRODUCTS:

Iron and Fire-Proof Buildings, Iron Fronts, Rolling Shutters, Roofs, Domes, Bridges, Railings, Verandahs, Balustrades, Stairs, Cornices, Columns, Capitals, Arches, Window Lintels and Sills, Consoles, Brackets, Rosettes, Urns, Door and Window Guards, Lamp, Awning and Horse Posts, Venetian Blinds, Patent Lights, Iron Side Walks, Rolled, Riv-etted and Cast Iron Beams and Girders, and all Architectural and General Iron Work.

H. M. BAILEY, Superintendant of Works.
J. WALTER CLARK, Accountant. J. M. DUCLOS, Arch.

OREGON IRON FOUNDRY,

738, 740, 742 and 744,

Greenwich Street, New York.

CASTINGS FOR

GAS WORKS

OF ALL DESCRIPTIONS, INCLUDING

Purifiers, Exhausters, Compensators, Self-Acting Valves, Branches, Bends, &c.

FLOYD'S PATENT

Malleable Iron Retort Lid.

SABATTON'S PATENT

Furnace Door and Frame.

Refers to—J. A. Sabatton, Esq., Engineer Manhattan Gas Co.—Col. A. J. White, Metropolitan Gas Co.—C. C Mowton, Engineer New York Gas Light Co.—J. Mowton Saunders, Engineer Baltimore Gas Co.—John T. Harrison, Engineer Savannah Gas Co.

135] HERRING & FLOYD, Proprietors.

SILAS C. HERRING. JAMES R. FLOYD

KEROSENE

Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

206 Pearl Street,

NEW YORK.

THOMAS CASSIDY,

Iron Founder & Pattern Maker

Corner Hudson and Park Avenues,
BROOKLYN.

Iron Store Fronts put up at short notice.

Square and Round Columns, Truss Girders, Vault Beams, Window Lintels, Sills, &c.

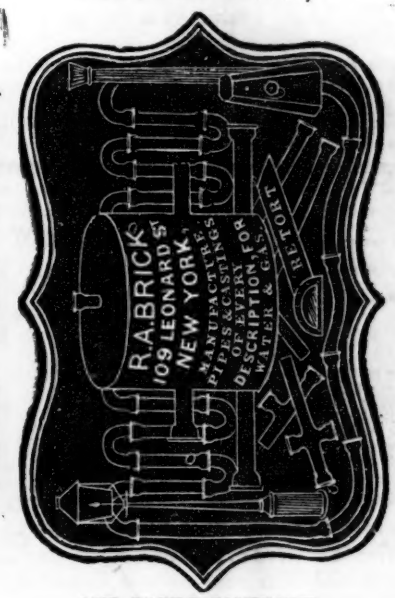
A large assortment of Railing Castings constantly on hand, or made to order, at the shortest notice.

Lamp Posts—Brooklyn Pattern.

☞A large stock of the usual sizes of Round Columns kept on hand.

DRIVING PIPE,

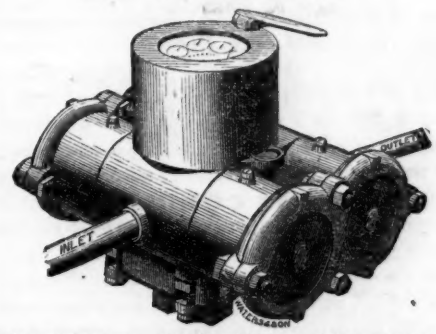
BERGEN IRON WORKS,



OFFICE 109 LEONARD STREET, NEW YORK.

AND BANDS COMPLETE.

H. R. WORTHINGTON'S



PATENT WATER-METER.

This Meter is also used for the measurement of Oil —it combines

ACCURACY, SIMPLICITY, and REMARKABLE DURABILITY with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

HENRY R. WORTHINGTON,
61 Beekman steet, N. Y.

WILCOX & GIBBS' SEWING MACHINE.

It is entirely noiseless. A patented device prevents it being turned backward. The needle cannot be set wrong. It received the gold medal of the American Institute in 1863. Send for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILCOX,
Manufacturer, 508 Broadway, New York.

[PRINCIPAL OFFICES:

NEW YORK—508 Broadway,
BOSTON—323 Washington-st.
PHILADELPHIA—720 Chesnut-st.
CHICAGO—188 Lake st.
CINCINNATI—80 West 4th-st.
LONDON—135 Regent-st.
HAMBURG—44 Herman-st
PARIS—82 Boulevard d Sebastopol
ST. PETERSBURGH—15 Gorochovay
VIENNA—9 Wildpretmarket.
BRUSSELS—12 Rue Croisade.
SYDNEY, Australia—212 Pitt-st.

Mining & Petroleum Standard
AND
AMERICAN GAS-LIGHT JOURNAL,

Published on the 2d and 16th of Each Month
At No. 22 Pine Street, New York.

BRYANT, CALLENDER & CO.,
EDITORS AND PROPRIETORS.

Profs. PARTZ & BUCK, Consulting Chemists.

MONDAY, DECEMBER 17, 1866.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its colums are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

CONTENTS.

The Cam Quartz Breaker and Pulverizer,	177	sumption of Smoke—Manufacture of Steel	180
Idaho Quartz Crusher	177	Photographing Cannon Balls	180
On National Standards for Gas Measurement and Gas Meters (concluded)	178	Steel Gun Barrels	180
Combustion of Fuel in Furnaces,	178	Oxidation by Air	180
To Prevent Street Cars Running off the Track,	178	Brevities	180
On a Defect in the Polariscope with a Simple and Effective Remedy,	178	Useful Receipes	180
The Sphynx,	178	Correspondence—Plastic Slate	181
Hydro-Geology	178	Mining Items	181
An Iron Mountain in Sweden	179	New Inventions and Ideas	181
The Process of Roasting Ores	179	Silver Mining versus Gold Mining	184
Economy of Heat and Con-		Editorial Courtesy	184
		Gas versus Coal, Etc	184
		Knight & Woodward's Cement Pipe Manufactory	185

Silver Mining versus Gold Mining.

There seems to be a certain class of people who can never be satisfied in their own minds, how and where to invest their money so as to get the largest possible returns, and in the shortest possible time. They cautiously look over the various reports, exhibits and circulars of the silver mining companies organizing or organized, and button-hole the stockholders or officers for hours, to get all the information they need; and to get, if possible, an offer of stock at "hard pan" figures, or a little better, even if they discover a new company with a valuable property in need of immediate capital, and expect to step in just as the company, after a couple of years hard labor and struggling, are on the point of a great success. Then the question of gold mining comes up and the same programme is gone through, and the comparative merits of each are discussed and studied, until vacillation and delay causes them to loose the coveted chance to invest, because some more liberal mind, more willing to contribute to the development of these great sources of national wealth and prosperity, has stepped forward and secured the golden chance, having faith in the motto, "nothing venture nothing gain."

Timid men in these times are not wanted, they are a positive nuisance—an incubus—and a detriment to the advancement of any new and great enterprise. Neither silver or gold mining can be commenced or carried on and made to pay without the outlay of capital; and generally, the larger the capital invested in developing the mines, by good and scientific surveys and plans, jduicious workings, and good reliable machinery, the greater will be the dividends.

Mining enterprises cannot be made to yield paying returns in a hurry. The most successful mining operations known, have required many years to develop in former times; and if with modern discoveries and appliances we can lessen the labor and abbreviate the time required, as is the case frequently, from one half to two-thirds, it should be satisfactory.

Whoever seeks to invest in mining enterprises, expecting to count his gains every night after having made an investment, had better go into the candy or peanut bnsiness, and let those who have the nerve "pitch in" and draw the prizes, and prove their ability as far-sighted business men, who are capable to "dare and do."

That gold and silver mining pays, has paid and will pay, requires no argument, when we see the many new names we know on the income tax list, opposite ten, fifty and hundred thousand dollars incomes. If we look closer, we will find there men, most of whom are no speculators, but practical earnest men, who are making mining a legitimate business, because they see its advantages above the ordinary avenues of trade or business.

The gold mines of California, Colorado and Nevada are to-day yielding a fair return for the money invested, despite the struggles and failures of the past, relieved by the few cases of success. Cases of failure and loss will occasionally occur hereafter, as heretofore. Inexperience, incapacity, fraud and folly will sometimes make the most promising and legitimate business a failure, and cannot be wholly guarded against. Human nature has its infirmities, which will "crop out" sometimes in mining enterprises, as well as in any other pursuit. But it is a well established fact, that where sound judgment, prudence and honesty prevails, the evidences of success are greatly increasing, and with past experiences as a teacher, it is reasonable to infer that the prospect for future success will steadily and constantly improve.

Silver mining in Nevada has been more generally successful than either gold or silver mining in any other State of the Union. Since their discovery—only about six or seven years ago—the Washoe and Humboldt mines have been the only districts worked to any considerable extent, and the amount of bullion they have yielded is many millions. In fact, the history of mining has no parallel where success has been so general—where so many gigantic fortunes have been realized in so short a time; and when the prospects for the future look so promising.

The Hale and Norcross mines reported $100,000 profit in twenty-three days in July, 1866, and was estimated they would yield $30,000 more during the month. The Savage had a surplus of $50,000. The yield of Gould and Curry for July last was $125,000; Crown Point $50,000 and Yellow Jacket for the year ending June last, $2,072,814.

Surely such figures as these have a significance which it is easy to understand, especially when it is considered that these results were obtained from ores which yield only $50 to the ton on the average.

The advantages of silver mining seems to be that the ores are more easily mined, and the silver is more easily extracted. The veins or lodes are more extensive, less likely to "pinch" or give out, and generally they grow richer and wider as they go down.

Editorial Courtesy.

Since we have had the administration of this Journal, we have been studiously careful that articles copied from other journals should be duly credited to the original parties, entitled to the honor of preparing them for publication, and we think we have never failed in that respect. We differ in opinion with one of our most respectable contemporaries, upon the question if an American journal copied from another American journal an article taken from a Foreign journal, whether it was necessto credit the American journal with re-publishing the article in this country. We took the position, that it was sufficient to give credit to the Foreign journal only. We did so upon the ground that several journals in our extended territory might simultaneously publish the same article, and therefore it would perhaps, be unjust to ascribe the publication to one, when others deserved the same compliment. Hereafter we shall give credit to the re-publisher here, as well as to the Foreign journal from which it was taken.

Now, in respect to ourselves. We have often articles and extracts from articles published in our Journal, adopted and assumed as directly editorial, or as though they were original articles for the journal or newspaper using them without an intimation that they had ever originated with, and appeared in, THE AMERICAN GAS-LIGHT JOURNAL.

Now this is not right, and we repudiate such a familiarity with us as to permit appropriations in this way. There is no scientific journal published in the United States at this day which contains more scientific and valuable information than the AMERICAN GAS-LIGHT JOURNAL, as an impartial reference to its columns will verify. The original and prepared articles which have been—especially of late—presented from the pens of the Professors Henry Wurtz and J. H. Tiemann, are of the most substantial and scientific character—others, without being named, have contributed compositions and information of value in some of the channels we move in, and we modestly claim for ourselves an occasional essay worth reading.

Hitherto we have not noticed the subject, because it was not so important to us as it has now become. Our Journal is constantly being applied for by scientific individuals and associations, and we feel that we should not only protect ourselves, but our contributers.

Lately we find articles by Prof. Wurtz, and others, copied in papers as though they were then first brought to light, and HILLYER'S PETROLEUM RECORDER of New-York, and THE MINER'S REGISTER of Colorado, have published (unaccredited) "The Process of Roasting Ores," translated from the German expressly for this Journal, by Professor J. H. Tiemann. For these latter articles the copyright has been secured, and if copied we expect the proper credit.

We wish a re-publication of any articles which appear in our Journal, when deemed of sufficient value, and feel complimented by it, provided we have the usual acknowledgement.

Gas versus Coal Etc.

The application of gas for heating and cooking purposes is becoming one of the institutions of this age of invention. It is a grand desideratum to have your heat end light-giving material supplied and conveyed directly to the stove without extra cost, and avoid the inevitable noise, dust, dirt and storage room necessary when coal, wood or other crude fuel is used. It is especially consoling to the *habittues* of upper portions of our altitudinous dwellings and elsewhere in cities and towns, to know that a little pipe will almost instantaneously furnish at his hand, by the turning of a stop-cock to a gas-stove, both light to see by, and heat for every necessity of a household, immeasurably more cleanly, healthy, convenient and positively more economically than any other known contrivance.

These assertions are made knowingly and from experience, and hold good, more especially in regard to the improved scientific gas-heating appliances of the Metropolitan Gas Stove Manufacttring Co., whose salesroom is at 702 Broadway, N. Y.

A. L. Bogart, Esq., of this company, Analytical Chemist and Gas Engineer, has made recent improvements of a scientific character, whereby a perfect combustion is obtained and the caloric evolved is rendered chemically pure, which entirely prevents the production of those deleterious gases—carbonic and sulphuric acids usually evolved in the combustion of coal gas.

Knight & Woodward's Cement Pipe Manufactory.

Our readers will find on our last page an engraving of a prominent New-York and Brooklyn establishment, for producing one of the most valuable articles known in manufacture, for house and street uses.

The use of hydraulic cement and concrete formed with it is, of late years, beginning to assume its proper rank in construction, and in process of time will supersede, as it did in the palmy days of Roman history, the unreliable substitutes which have been too long accepted in its place. This firm have carried the details of pipe manufacture to great perfection, so as to produce pipes of various forms, diameter and length, with entirely symmetrical lines and joints, made of a material which sets rapidly, and then continues to crystallize for indefinite periods.

For house drainage and city sewerage, these pipes have been largely used, as in Brooklyn, Central Park, New-York, Jersey City, Elizabeth, Albany, Hartford, Bridgeport and various other places; for railroad culverts, their superior convenience, efficiency and economy have led to their extensive adoption, as on the Delaware and Raritan Bay, Athens and Saratoga, South side of Long Island, North shore Long Island, and other railroads; and their superior forms and quality have elicited the approval of various hydraulic engineers, who have become by practice familiar with the defects of stoneware pipes which are liable to warp and crack in baking and understand the necessity of a thoroughly tempered and carefully prepared morter in the concrete materials from which the pipes are moulded. Probably in practice the manipulation of hydraulic cement and its concrete, was never carried to a nicer grade of perfection than in the processes adopted, after long investigation, by Mr. Knight, under whose patents these pipes are made.

☞ Dr. Davis's Sheep-Shearing Machine.—This remarkable invention is illustrated in another part of the journal, and although it belongs more particularly to an agricultural paper, still, as it was handed in by a friend, we are happy to give it publicity. It is one of those original and evidently valuable inventions which will supply a great need, and the public are likely to appreciate it accordingly. Like the sewing machine, it appears to involve a fundamental principle, which makes it the more important in these days of imitations, devices, and combination patents, where mechanical skill takes the place of true invention.

We believe the inventor intends to apply the power also by means of a treadle. If so, we suggest to have a foot treadle combined with a table upon which to place the sheep, so the operator can sit at ease and work the machine at the same time, without an assistant.

The Alpine Miner—a paper published at Monitor, Alpine county, California, is a well gotten up sheet, typographically and otherwise, and an acceptable accession to our exchange list, because it is filled with the latest mining news, and seems to take a laudable interest in local mining and general news.

BAY STATE FIRE-BRICK AND CLAY RETORT WORKS.
CHELSEA, MASS.
DAVIS & CHADDOCK,
MANUFACTURERS.
Office Nos. 125 and 127 Water-st., Boston.
Also agents for the sale of J.K. BRICK & Co's, Clay Retorts, Fire-Brick, Gas-House tile, etc. 66tf

The Mercantile Library Reading Room is an institution of such local value, that too much cannot be said in its favor. It has one of the largest and best assorted libraries in the city. The best selected magazines and newspapers of this country or Europe are to be found there. It has a very valuable library of reference. Of late, we understand, an arrangement has been made to supply members with books, etc., at their houses or places of business. A very excellent plan. The Mercantile Library is at Clinton Hall, Astor Place; down town office, 59 Liberty street.

Turnbull's Automatic Purifier.—This invention was fully illustrated in the last number of this journal. It seems to have attracted considerable attention from the gas fraternity and others. We beg to refer to the advertisement on page 185.

METROPOLITAN
GAS STOVE MANUFACTURING COMPANY.
Salesroom, 702 Broadway,
Above Fourth Street, New York.
PATENT GAS HEATING AND COOKING STOVES, RANGES, &c.
SCIENTIFIC GAS HEATING APPLIANCES,
For every known trade or profession.
Patent Petroleum or Aerovapor Stoves. Patent Kerosene Oil Stoves. Patent Portable Vapor Bath Apparatus.
Gas Stoves made by us are constructed under the immediate supervision of A. L. Bogart, Esq., Analytical Chemist and Gas Engineer. They contain recent improvements of a scientific character—by means of which a perfect combustion is obtained, and the Caloric produced, rendered chemically pure. Too much cannot be said against the use of Gas Stoves for heating apartments—when the products of combustion (Carbonic and Sulphurous Acid,) are emitted without purification into the atmosphere. Your Physicians will inform you, that this is a subject of vital importance and worthy of your closest scrutiny—before purchasing. The public are invited to examine into the merits of these inventions.
Every article warranted as represented.

TURNBULL'S
AUTOMATIC PURIFIER.
STATE RIGHTS FOR SALE ON LIBERAL terms. For further information address by letter, Wm. C. Turnbull, care of T. C. Babcock, 59 Broadway, or to the Editors of this Journal.

OPPOSITION LINE.
TO CALIFORNIA VIA NICARAGUA,
SAILING EVERY TWENTY DAYS,
With Passengers, Freights, and United States Mails, on the following first class Steamships:

On the Atlantic Ocean,	On the Pacific Ocean.
Steamship Santiago De Cuba.	Steamship America.
" San Francisco.	" Moses Taylor.
" Dakota.	" Nevada.

PASSAGE AND FREIGHT AT REDUCED RATES.
Sailing days from New York.

1866.	December 20th,	January 10th and 30th.
1867.	February 20th,	March 10th and 30th.
"	April 20th,	May 10th and 30th.

And so on at intervals of twenty days leaving on the Saturday previous, when a regular sailing day comes on Sunday.
For further information, apply at the Company's office, 177 West-st. corner Warren-st. N. Y.
66tf D. N. CARRINGTON, Agent.

THE WOODWARD
Steam Pump Manufacturing Company,
MANUFACTURERS OF THE WOODWARD PATENT IMPROVED
SAFETY STEAM PUMP,
—Adapted for Mining and Fire Purposes—and
Steam, Water & Gas Fittings of All Kinds
Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,
Woodward Building, 76 and 78 Centre St.,
corner of Worth street,
Formerly 77 Beekman Street, *New York.*
53 GEO. M. WOODWARD, Pres't. 64

THE
WASHINGTON MILL
AND
SILVER MINING COMPANY
OF ECHO DISTRICT, HUMBOLDT CO., NEVADA.
Capital Stock $300,000,
Issued for Mining Purposes.
60,000 Shares at Five Dollars each.
OFFICERS:
President—J. Clements Stocker.
Vice-President—John J. Thomas.
Secretary and Treasurer—Henry Lee Reynolds.
Superintendent—William S. Sargent.
TRUSTEES:
J. Clement Stocker, New York City.
John J. Thomas, New York City.
Lewis W. Phillips, New York City.
E. Page Davis, Unionville, Nevada.
Henry Lee Reynolds, New York City.
Office of the Company, 30 Pine street, New York.
☞ The Mine of this Company rapidly approaching that point of development which will necessitate the erection of a Mill, the Trustees are authorized to dispose of 10,000 shares of the reserve capital stock.
Sealed Tenders will therefore be received at the office of the Company, 30 Pine street, Room 4, till December 20th, 1866, at noon. The Officers of the Company reserve the right to reject all bids under par.

FOR SALE.
THE VALUABLE IMPROVEMENT FOR Saving and otherwise improving the Gas, invented by Dr. J. S. Wood, described in the "Gas-Light Journal" October 2d, 1866, is now for sale by State or County rights.
Address J, S. Wood, Patentee, No. 400 Liberty st., Philadelphia, Pa.

J. FIRMIN,
Gas Fitting and Plumbing,
Nos. 64 & 66 Maiden Lane, cor. William-st.
Residence, No. 1147 Broadway, near 26th-st.
HOUSES FITTED UP WITH PLUMBING AND GAS WORK IN THE MOST MODERN AND IMPROVED STYLE. SEWERS CONNECTED. BRASS AND LATHE WORK. JOBBING IN ALL ITS BRANCHES ATTENDED TO WITH PUNCTUALITY AND DISPATCH.

GAS BILLS REDUCED.
Gas Lights perfected upon New and Unerring Principles.
REFERENCES:
At A. T. Stewart's the gas-lights were improved and the gas bills reduced one-third, amounting to several thousands of dollars per year.—A. O. Willcox, No. 40 Wall-st.
At the Tribune Association gas bill reduced upwards of one hundred dollars per month, and better lights given.—Samuel Sinclair Publisher.
At H. B. Claflin's, late Claflin, Mellen & Co., gas bill reduced—amount not yet ascertained—but it will be at the same ratio, and light improved.—Mr. Bancroft.
At Wm. Schieffelin & Co.'s, corner William and Beekman-sts., good light obtained and maintained at all parts of the premises, without additional cost—a result despaired of even by the Gas Co. owing to the deficiency of supply. No deficiency by Firmin's system.
Similar results guaranteed under similar circumstances, or NO CHARGE. 65-88

EMPIRE LINE
FOR SAVANNAH, GEORGIA,
Every Saturday, the elegant Side-Wheel Steamships
SAN SALVADOR,
Commander, Joshua Atkins, and
SAN JACINTO,
Commander, Winslow Loveland.
Every SATURDAY, from pier 13 North River.
Have been placed on the route to Savannah by the Atlantic Mail Steamship Company of New York, and are intended to be run by them in a manner to meet the first class requirements of the trade.
The cabin accommodations of these ships are not excelled by any Steamers on the coast, and although their carrying capacity is large, their draught of water enables them to insure a passage without detention in the river

San Jacinto,	Saturday,	Oct.	6	San Jacinto	Saturday,	Nov.	3
San Salvador,	..	"	13	San Salvador	..	"	10
San Jacinto,	..	"	20	San Jacinto	..	"	17
San Salvador,	..	"	27	San Salvador,	..	"	24

Returning, leave Savannah every Saturday at 3 o'clock, P. M.
Bills of Lading furnished and signed on the Pier.
For further particulars, engagement of Freight or passage, apply to
GARRISON & ALLEN, Agents,
No. 5 Bowling Green.
Agent at Savannah, B. H. HARDEE.

ALBERT C. KUCK,

Manufacturer and Dealer in

COAL OIL

LAMPS,

CHIMNEYS,

BURNERS,

WICKS,

SHADES,

BRACKETS,

AND

CHANDELIERS

In all varieties and at manufacturers' prices.

AGENT FOR THE CELEBRATED

"Eureka" and "Nonpareil" Lanterns.

FRUIT JARS OF ALL KINDS AND SIZES.

57 FULTON STREET, NEAR CLIFF St.,

NEW YORK.

F. H. LOVELL & CO.,

Successors to Alfred Bliss & Co.

MANUFACTURER AND JOBBERS OF

KEROSENE

LAMPS

CHANDELIERS,

BRACKETS,

AND

Lamp Trimmings

GENERALLY.

Station, Sugar House, Street and Coal Oil Lanterns.

No. 233 Pearl Street,

152-182 *NEW YORK.*

Illustrated catalogues and price lists furnished on application.

NEW YORK LAMP COMPANY,

259 Pearl Street, New York.

We Would call especial attention to our recently improved

UNION BURNER,

which now burns without SMOKE OR ODOR. With Coal or Petroleum Oil makes the cheapest light known,

One Cent for Eight Hours.

The improved Union Burner without chimney, for a hand or portable night lamp is unrivalled.

Patented in the United States, England, France and Belgium.

NEW YORK LAMP CO.,

58 259 Pearl-street, near Fulton, New York.

Something New and Useful.

A POCKET LANTERN, which, when folded, occupies the space of a cigar case, and when open gives a good light. The most convenient article for any one who is liable to be out at night. Sample sent by mail on receipt of one dollar.

Address

NEW YORK LAMP CO.,

57 259 Pearl-street, New York.

The Aladdin No-Chimney Burner

GIVES A BRILLIANT LIGHT WITHOUT THE use of a chimney. Fits on to almost all kerosene lamps. It is the best no-chimney burner made, and no family should be without them. Samples sent by mail on receipt of 50 cents.

Address

NEW YORK LAMP CO.,

57-62 259 Pearl-street, New York.

R. L. DELISSER & CO.,

DEALERS IN MINERAL LANDS

—AND—

PATENT RIGHTS,

No. 69 Beaver St., NEW YORK.

152-176

WILLIAM ELTING

Manufacturers Agents for the Sale of

PORTABLE AND

Stationary Steam Engines,

BOILERS AND MACHINERY,

No. 95 Liberty-St, NEW YORK.

☞ Leather and Rubber Belting supplied at usual rates. Circulars sent on application. 55-78

MOREY & SPERRY,

Manufacturers of

HEPBURN & PETERSONS, AND BEATH'S

Amalgamators, Stamp Mills,

Quartz Crushers, and other

MINING MACHINERY.

ALSO AGENTS FOR

Foundries in San Francisco, Cal., and are prepared to make time contracts to erect Mills completed, on the premises in California, Nevada and other Territories.

Office No. 95 LIBERTY ST., Rooms 10 & 11.

152-176 **New York.**

A. HITCHCOCK,

Inventor and Manufacturer of the

Cam Quartz Breaker and Pulverizer,

REVERSIBLE ROLLER MILL,

IDAHO MILLS & AMALGAMATORS,

Adapted to All Kinds of Power.

Unequalled for utilizing power—avoiding friction and wear,—rapidity of work, and facility of transportation and adjustment. Also, **Hitchcock's Adjustable Tubular Flue-cleaning Boiler,** and other valuable Patents, for which license to manufacture will be granted on reasonable terms.

Circulars furnished on application.

53-76 *Office No. 4 & 6 Pine Street, New York.*

GEO. H. BRONSON,

132 Malden Lane, New York,

Dealer in

Paraffine Machinery Oil,

From PURE CANNEL COAL, adapted to all classes of

Stationary Machinery,	Woolen Factories,
Locomotive Engines,	Cotton Spindles,
Railroad Cars,	Sewing Machines, &c.

Paraffine Wax and Paraffine Wax Candles. Also the best brands of Burning Oils. All Oils guaranteed to answer the purpose for which they are recommended.

57 80

D. B. GRAY,

DEALER IN ALL KINDS OF

INDIA RUBBER GOODS

Vulcanized Machine Belting,

Conducting, Hydrant, and Engine Hose,

GUM STEAM PACKING,

Amidon's Improved Clothes Wringer,

And all kinds of Useful and Fancy Rubber and Vulcanite Goods,

No. 201 Broadway,

Middle of the Block between Fulton and Dey Streets, NEW YORK.

WILLIAM S. CARR & CO.,

Succesor to Sawyer & Co.,

SOLE MANUFACTURERS OF

Carr's Patent Water Closets,

URINAL VALVES, &c.

Also Manufacturers and Dealers in PLUMBING MATERIALS OF EVERY DESCRIPTION, Plumbers' Brass Works, Earthen Ware, Pumps, Iron Drain Pipes, Traps and Sinks, Copper Bath Tubs, Showers, &c., &c.

OFFICE AND MANUFACTORY

149, 151, 153, 155, 157 Centre Street, cor. Canal,

NEW YORK.

Illustrated Catalogue and Price List sent on application.

152-176

CHARLES H. REICHMANN,

Manufacturer and Jobber of

LAMPS,

Petroleum Stoves, &c.

AND IMPORTER OF

Porcelain Shades,

WICKS, &C.,

No. 45 Fulton St.,

[Bet. Pearl and Cliff]

NEW YORK.

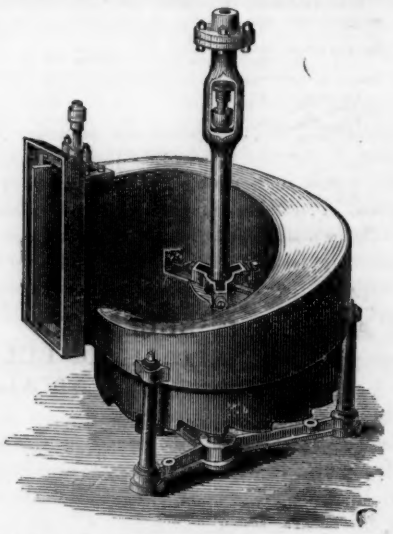
ALL ORDERS promptly filled for his Patent Petroleum Stoves or Lamp Heaters, which are acknowledged to be superior to any other article of the kind now in use, as regards economy in consumption of oil, as well as simplicity of construction.

These Cooking Apparatus are used like any coal oil lamp, being provided with a sheet metal chimney, in consequence of which they burn without odor or smoke. They radiate no heat into the room, and are therefore very desirable in hot weather.

Also, Nursery and Night Lamps combined, a superior and cheap article for nursery or sick room; has a kettle, cup and pan, complete.

STEVENSON'S

Helical Jonval Turbine Water Wheel,



For first-class mills and factories where great economy of water and simplicity and durability are required.

Manufactured by the Patentee,

J. E. STEVENSON, Hydraulic Engineer,

40 Dey Street, New York,

☞ Stevenson's Jonval Turbine Water Wheel gave the highest per centage of power over all others at the trial of Water Wheels at Fairmount Works, Philadelphia, March 9th, 1860. NINETEEN WHEELS WERE TESTED. The only practical test on record.

PORTABLE CIRCULAR SAW MILLS

With STEARN'S PATENT SETS, far superior to Rack and Pinion and Screw sets. Years of wear will not cause lost motion. All plank sawed with perfectly even thickness. No time lost in setting. Suitable for sawing any kind of Lumber and Timber.

SUPERIOR MULAY MILLS

With the latest improvements, at reasonable prices.

Steam Engines and Boilers

Especially adapted to lumbering purposes.

FOR SALE.

PORTABLE FLOUR AND GRIST MILLS.
WATER-WHEEL GOVERNORS.
ROTARY HAND AND POWER PUMPS.
RUBBER AND LEATHER BELTING.
CIRCULAR SAWS.

53-76

J. H. TIEMANN.

ANALYTICAL CHEMIST,

Metallurgist & Mining Engineer.

240 PEARL ST. Cor. BURLING SLIP, N. Y.

tf

MANHATTAN

Fire Brick & Enamelled Clay Retort Works,

A URER & WEBER,

(Of the late firm of B. Kreischer & Co.)
PROPRIETORS.

Office & Works in 15th street, Avenue C,

MANUFACTURERS OF

Fire Brick and Tiles,

OF ALL SHAPES & SIZES,

Fire Mortar, Clay and Sand.

☞Articles of every description made to order, at short notice. (135

HY. MAURER. ADAM WEBER.

NEW YORK

Fire Brick and Clay Retort Works

☞ *Established in* 1845, ☜

(Branch Works at Kreischerville, Staten Island,)

B. KREISHER,

Office 56 Goerck St, cor. Delancey, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes.
FIRE MORTAR, CLAY, and SAND.
Articles of every description made to order at the shortest notice.
B. KREISCHER.

J. K. BRICK & Co,

BROOKLYN CLAY RETORT,

—AND—

FIRE BRICK WORKS,

VANDYKE STREET, BROOKLYN, N. Y.

JOSEPH K. BRICK, EDWARD D. WHITE.

J. H. GAUTIER & CO.,

MANUFACTURERS OF

Gas Retorts, Tiles and Fire Bricks,

Black Lead Crucibles, and Carburet of Iron Stove Polish,

JERSEY CITY, N. J.

Refer to—Manhattan Gas Light Co., New York. [135

Philadelphia Fire Brick Works,

Corner of Vine and Twenty Third sts., Philadelphia,

JOHN NEWKUMET,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

PRINCE'S METALLIC PAINT.

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though said at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, ouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agent—CALVIN GAY, 29 Federal st., Boston.

AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

JOHN B. ROBINSON,
No. 36 DEY STREET, NEW YORK.

List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	34	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	39	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	113 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8¼	5 00
35	10	8 75
50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

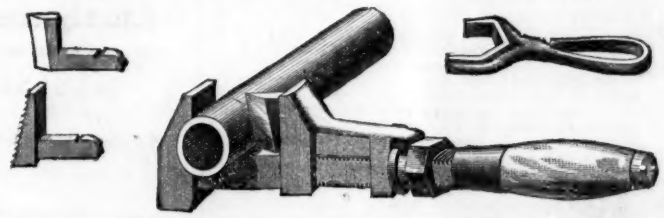
Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by urning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal. JOHN B. ROBINSON, 38 Dey Street, N. Y.

WEBSTER'S PATENT WRENCH,



For Cutting Off & Screwing up Pipe, Round Rods, Bolts, Nuts, &c.

RECEIVED SPECIAL GOLD MEDAL FROM THE AMERICAN INSTITUTE
SEPTEMBER, 1865.

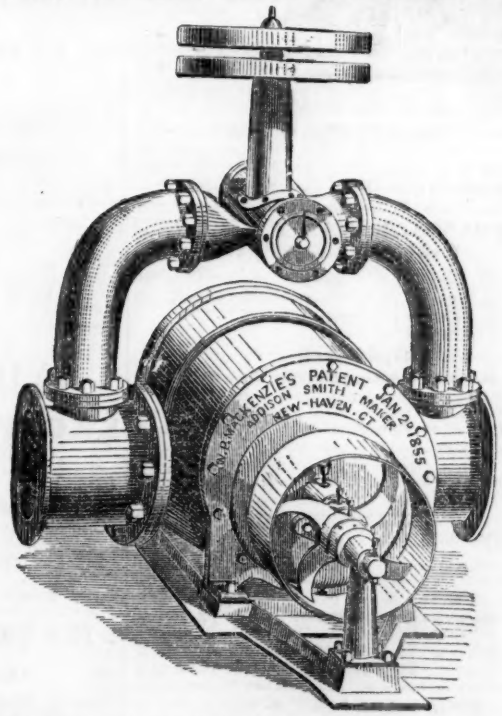
WEBSTER & CO.,

Sole Owners and Manufacturers, No. 17 Dey Street,
NEW YORK.

Smith & Sayre Manufactnring Company.

The Mackenzie Patent Gas Exhauster,

AND PATENT COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 ons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address

B. KREISCHER,, Prest.
JAS. SAYRE, Treas,
CHAS. W. ISBELL, Sec'y. Office 484 Broadway, New York.

GAS-METER GLYCERIN.

WE SOLICIT THE ATTENTION OF GAS COMPANIES to our GLYCERIN, which is now generally known, and is undoubtedly the best article ever used for filling Gas meters. Glycerin of 15° Baume will stand 14° below zero without freezing, and the greater the density the lower the temperature it will stand.

We have sold to most of the large companies throughout the country, and annex a few certificates showing its value:

OFFICE OF THE CINCINNATI GAS-LIGHT & COKE CO., CINCINNATI, OHIO, NOV. 25, 1865.

I take pleasure in stating that the glycerin furnished by W. J. M. Gordon & Bro., of Cincinnati, has been used in wet meters by this Company during the past two years, and has proved very satisfactory thus far. Having resisted the action of frost, and not evaporated more than about six per cent. each year.

The standard for density being 15° Baume's scale.

H. I. MILLER, President.

OFFICE GAS-LIGHT CO., BALTIMORE, Dec. 16, 1864.

MESSRS. W. J. M. GORDON & BRO.—Of the numerous fluids used by this Company in their gas-meters to prevent freezing, none have given the satisfaction of the Glycerin manufactured for that purpose by the Messrs. Gordon & Bro., of Cincinnati, Ohio. As Glycerin will withstand a temperature below anything in the latitude of Baltimore without congealing, and as it does not evaporate like the alcoholic mixtures, once filling a meter will last for years. Yours respectfully,

J. MORTON SAUNDERS, Engineer.
COLUMBUS O'DONNELL, President.

Glycerin for Printers' Rollers.

It is coming into general use for this purpose, as rollers will not dry and shrink as when made in the usual way.

OFFICE OF THE DAILY & DOLLAR WEEKLY TIMES, CINCINNATI, Nov. 27th, 1865.

I hereby certify that I have used the Glycerin manufactured by the Messrs. W. J. M. Gordon & Bro., of this city, in the manufacture of printing rollers, and find it a most valuable addition to the composition in general use. THOMAS F. WINTER,
Pressman Times Office, Cincinnati, O.

November 29, 1865.

We have used the Glycerin manufactured by W. J. M. Gordon & Bro, of this city, for the last seven years. We find it in our line of business—printing playing cards, using colored inks to a great extent,—a very superior and indispensable article. We use about one-sixth quantity of it to the amount of molasses in making our rollers. We find it prevents them from shrinking up, and causes them to retain the desired "tack." We confidently recommend the article for the desired purposes. LONGLEY & BROTHER,
Playing Card Manufacturers, Cincinnati, Ohio.

Glycerin is also used by the Cincinnati Commercial and Enquirer, to whom we refer.

We manufacture Glycerine of every quality used, and from our advantage in material we are enabled to sell it lower than any manufacturer in the country.

W. J. M. GORDON & BRO.,
MANUFACTURING CHEMISTS AND DRUGGISTS.
63] N. E. Cor. Central-ave. and 8th st., Cincinnati, Ohio.

GLYCERIN

For Wet Meters, Gasoline Machines, Hydraulic Presses, &c.

We warrant our Glycerine free from acid and not to corrode the Meter metal, or to congeal or freeze at a stated temperature—also, not to evaporate to any extent. The advantages and savings derived from the use of our fluid can be testified by many Gas Light Companies which we have supplied. We only refer to the certificates of H. J. Miller, Esq., President of Cincinnati G. L. and Coke Co., and Dr. J. Lawrence Smith, Professor of Chemistry in the Louisville College, and President of the Louisville Gas Co.

HARTMAN & LAIST,

Office No. 41 East 2d street, Cincinnati,—Chemical Works on Providence street, and Miami Canal, near Findlay sreet.

CERTIFICATE

Office Louisville Gas Co., Louisville, June 28, 1865.

This is to certify, that the Louisville Gas Co. have used for about two years, the Glycerine prepared by Messrs. Hartman & Laist of Cincinnati, in their Wet Meters, and have in all instances found it to give most perfect satisfaction. Prior to the use of the above Glycerin, we had employed that manufactured by other parties, and we consider H. & L.'s superior to any we used.

J. LAWRENCE SMITH, President.

Office Cincinnati Gas Light and Coke Co., July 7, 1865.

This will certify, that Messrs. Hartman & Laist of Cincinnati, furnished this Company with Glycerin for Wet Meters some two years since. It has proved very satisfactory, having resisted the action of frost during two winters and evaporating not more than six per cent. per annum, as guaranteed by them. The standard being, for density, 15 deg. Beaume's scale. They were the first to introduce it practically to this Company. H. J. MILLER, President.

☞L. BRUCKMANN, 67 Wall street,
Agent for New York.

Worthington's Steam Pump,

Extensively used by

GAS-LIGHT COMPANIES,

For sale at greatly reduced prices. Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

☞ Patent GATES for Water and Steam-stops. ☜

HENRY R. WORTHINGTON,
161 61 Beekman-st, New York.

PLASTIC SLATE ROOFING
JOINT STOCK COMPANY.

OFFICE 157 [Room 19] BROADWAY,

New York.

W. C. POTTER, Vice Pres't.
J. M. ALLEN, Sec. and Treas. LICENSES GRANTED.

PLASTIC SLATE
FOR
ROOFING & OTHER PURPOSES.

The process of reconstructing Slate Stone from a disintegrated state was

PATENTED FEBRUARY 21st, 1865.

It is a combination of

Pulverized Slate & Viscous Matter,

(the latter possessing qualities of geological and chemical affinity for the former,) and is a development of one of the simple but unalterable tendencies of nature.

As a Roofing Material it Stands Unrivalled.

A mastic—it adapts itself to every shape and slope. Non-combustible, impervious, non-expansive, and undecaying.

Frost does not Crack nor Heat Dissolve it.

The only roofing material ever discovered that will resist the action of the elements as long as the structure it protects. Being susceptible of little, if any wear, from exposure, and

Perfectly Fire-Proof,

It is unequalled as a coating for Railroad and Farm Buildings, Fences, Bridges, bottoms of Vessels, Vaults, etc.

Edw'd Van Orden & Co.,

Manufacturers of Fire and Water-proof

Plastic Slate Roofing Materials,

ROOFING TOOLS, &C.

Office 41 Liberty-st.

Edw'd Van Orden.
Jas. E. Dunn. NEW YORK.

MILLS CONVENIENT FOR SHIPPING.

PARTZ & BUCK

MINING ENGINEERS, METALLURGISTS

AND

ANALYTICAL CHEMISTS,

57 BROADWAY,

A. F. W. PARTZ,
C. ELTON BUCK, NEW YORK.

CHAS. HOWDON SMITH,

BROKER IN MINING STOCKS

AND OTHER SECURITIES,

No. 5 1-2 PINE STREET,

ROOM NO. 5. NEW YORK.

T. CASSIDY & CO.,

(SUCCESSORS TO P. CASSIDY,)

Dealers in Old and New

IRON, COPPER, BRASS,

LEAD, SPELTER, &c.

Corner of Bridge and John Streets,

BROOKLYN.

☞ N. B.—The highest cash price paid for the above named articles.

T. CASSIDY. 57-80 J. PEARCE.

NATIONAL FOUNDRY
AND PIPE WORKS.

Office and Works—Carroll, Pike, Smallman and Wilkins Streets,

PITTSBURGH, PA.

WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.

I offer special inducements to parties wishing to purchase, my Pipe is Smooth, regular in weights, and cast vertically.

N. B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

☞ SEND FOR CIRCULAR AND PRICE LIST. ☜
149

JOSEPH NASON & CO.,

No. 61 Beekman street, corner of Gold,

NEW YORK.

Manufacturers of WROUGHT IRON PIPES and Fittings for Steam, Gas and Water, Boiler Flues, Steam Boilers, Coils, Heaters, Evaporators, Pumps, Ventilating Machinery, and Apparatus for Warming Buildings by Steam and Hot Water.

OIL TUBING, CAST IRON DRIVING PIPE, Boring Tools, Oil Pumps, Sand Pumps, Stuffing Boxes, Tongs, Clamps, Swivels, Joints, &c. 131

BIRD, PERKINS & JOB.,

(Formerly J. P. Melledge & Co.,)

General Commission Merchants,

And Importers of

PROVINCIAL COAL,

For Gas, Steam and Iron Manufactures.

89 India Wharf,..... .....Boston.

SAM'L T. BIRD, JAMES D. PERKINS, DANIEL W. JOB. [134

Represented in New York by GEORGE H. BREWER,
No. 104 Wall Street.

THE AUBIN BALANCED
VALVE WATER METER,

(Used also for Oils and Liquors)

IS NOW IN USE BY MANY CITY WATER Companies, because of its LOW PRICE, SIMPLICITY, DURABILITY, ACCURACY UNDER ANY PRESSURE, and, (a great advantage,) because it runs with less head than any other meter used.

Manufactured by

H. Q. HAWLEY,
Albany, N. Y.

BRAYTON'S
Patent Steam Generator,
AND ENGINE.

A PERFECT SUCCESS. BY THIS INVENTION the long sought-for object has been accomplished; to wit: A means by which steam can be generated safely, so that there shall be no more danger from explosion than with the hot-air engine, and at the same time retain all the power of the steam engine. This much sought for result has at last been accomplished, and after many severe tests we feel fully warranted in offering this Steam Generator and Engine to the public as a perfectly safe power, and at the same time a cheap power. As a generator of steam for heating buildings, etc, there is not its equal in use. For further information or circular, address

R. A. HUTCHINSON,
159-182 Agent, No. 8 Dey-street, New York.

H. P. GENGEMBRE'S

PATENT

Non Freezing and Non Evaporating
METER FLUID,

☞ Far cheaper than any other in use. ☜

For Filling Wet Gas-Meters, cheaper, in the long run, than water.

Six years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend the patent with perfect confidence.

For information and purchase of rights, apply to
A. DOISEY, Esq., Sole Agent,
Box 2,180, Cincinnati, Ohio, or to
H P. GENGEMBRE, Pittsburgh, Pa.

WILLIAM TAYLOR & SONS,
COLUMBIAN IRON WORKS,

Nos. 11, 13 & 15 Adams Street, Brooklyn, N. Y.

MANUFACTURERS OF ALL KINDS OF

Castings, Iron Buildings Store Fronts, Columns, Girders and Beams.

Steam Engines, Mill Gearing, Hydraulic Presses for the manufacture of Linseed and Cotton Seed Oils, Sugar Mills, Single and Double Action Pumps, also Steam Pumps, Coal Oil Machinery, High and Low Pressure Boilers, Tanks, Kettles, Soap Curbs, &c.,

MADE AND REPAIRED AT THE SHORTEST NOTICE.

WM. TAYLOR. JAMES A. TAYLOR. EDWIN S. TAYLOR.

CATALOGUE of Scientific, Military, Naval and Miscellaneous BOOKS just published, and sen free on application.

D. VAN NOSTRAND,

PUBLISHER,

168 192 Broadway, New York.

T. B. BYNNER,

IMPORTER AND DEALER IN WATCHES AND JEWELRY, Agent for the AMERICAN WATCH. Also every variety of Swiss and English watches, AT THE LOWEST MARKET PRICES.

189 BROADWAY, NEW-YORK.

Opppsite John Street. 62-85

FOR SALE.

ONE SET 18-INCH HYDRAULIC MAINS FOR Five Benches of three retorts each, with Dip, Bridge and Stand Pipes and Mouth Pieces complete. Apply at the Office of the

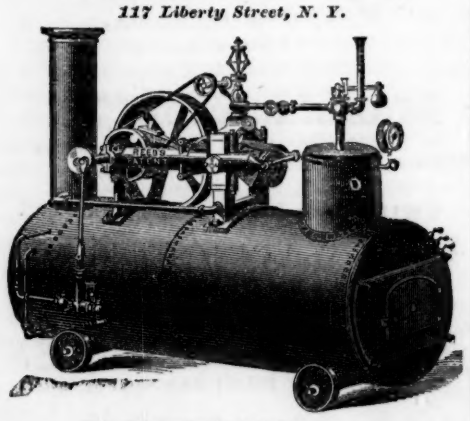
SALEM GAS-LIGHT CO.

62tf Salem, Mass.

REED & COGSWELL,

CONSULTING ENGINEERS,

117 Liberty Street, N. Y.



MANUFACTURERS OF

Slide & Oscillating, Stationary & Portable

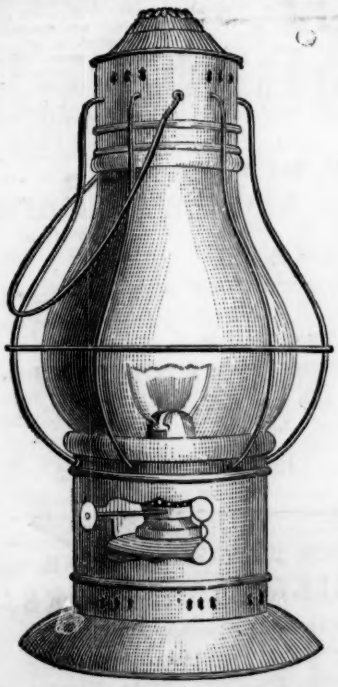
ENGINES,

Of all sizes. Also furnish all kinds of MACHINERY, TOOLS, AND GENERAL SUPPLY. Drawings of all kinds of Machinery executed to order.

JOHN A. REED. [63-86] W. B. COGSWELL.

JAS. O. SMITH & SONS,

MANUFACTURERS of LANTERNS,



81 FULTON, 55 GOLD, AND 90 ANN STREETS, N. Y.

We would especially direct attention to LATE IMPROVEMENTS in our No. 4 SMITH'S LANTERN, (for which we have applied for patent,) having a GLASS LAMP so constructed that the light passes through the bottom of the Lantern; also, the guards are so arranged as to dispense with soldering the top part of the guard to the trimming, obviating the difficulty that so frequently occurs in other lanterns of the guards melting off.

We are manufacturing at our factory, Middletown, Conn., MANY OTHER STYLES AND SIZES, which can be seen at our Show Rooms, 81 Fulton-st., New York. TRIMMINGS, etc., always on hand.

☞ The Trade are invited to call and examine our Stock.

EDDY'S

Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

ALEX. M. LESLEY,

Manufacturers, No. 605 Sixth Ave., New York.

Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufacturers,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

Send for a Circular—Agents wanted.

DALTON KNITTING MACHINE CO.,

137] 537 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 20 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency. 389 Broadway, N. Y.

Below we give a few prices:

No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

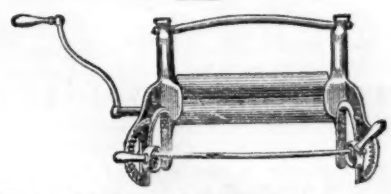
WEED SEWING MACAINE Co.,

130, 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

That wood soaked in water will *swell, shrink,* and *split.*

That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 200 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.

Sample Wringers sent, express paid, on receipt of price.

Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,

18 PLATT STREET, New York,

BENNINGTON, Vt.,

CLEVELAND O.

C, GEFRORER,

MANUFACTURER OF

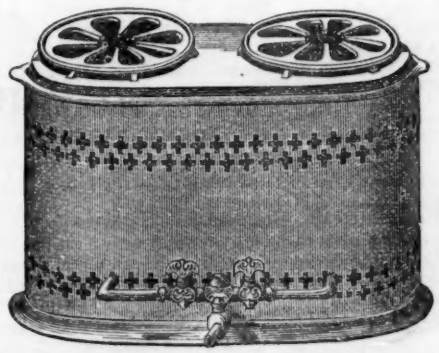
Gas Heating Apparatus

OF EVERY DESCRIPTION,

Gas Burners, &c.

No. 529 COMMERCE STREET,

PHILADELPHIA, PA.



Burners for Wood Coal Oil and Water Gas

Gas and Lava Burner Tips

65 *Constantly on Hand.*

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer

Trustees.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishment, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by
HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.
John C. Cresson, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.
G. S. Hookey, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, Birkinbine & Mears.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufactur in the United States. Respectfully Yours George Wiegand, Inspector of Gas Fittings, Philadelphia

C. GEFRORER,

MANUFACTURER OF GAS BURNERS,

529 Commerce Street, Philadelphia, Pa.

Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

GROVESTEIN & CO.,

PIANO FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"
RECEIVED THE HIGHEST PREMIUM AT THE
CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1,	Seven Octave,	round corners,	Rosewood,	Plain Case, $275
No. 2,	"	"	"	Heavy Moulding 300
No. 3,	"	"	"	Louis XIV style 325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds. Descriptive circular sent free on application.

Dr. M. C. Davis's Sheep-Shearing Machine.

A represents the frame: B, driving wheel; C, main driving band; D, pulley, driving band E; F, pulley, driving band H; I, pulley, driving crank communicating with and working shears J; K, jointed bar; L, L, swivel, forming two universal joints; M. M, guide pulleys on jointed bar K.

This invention, patented January 3rd, 1865 and March 15th, 1866, relates to a new and improved sheep-shearing device, and may be turned by a boy, or driven by other power—the shears running with lightening speed, being simply guided by the operator. As a labor-saving machine it is not excelled, doing the designated work many times more expeditiously than by hand, while the fleece is cut close and evenly. The construction of the shears is such as to render impossible the cutting of the sheep, while little or no experience is required to use it. The machine is cheap and simple in its construction, and not liable to get out of order. It has been practically tested for the past two seasons by wool growers in Ohio, who commend it highly. A working model is on exhibition at the office of the subscriber.

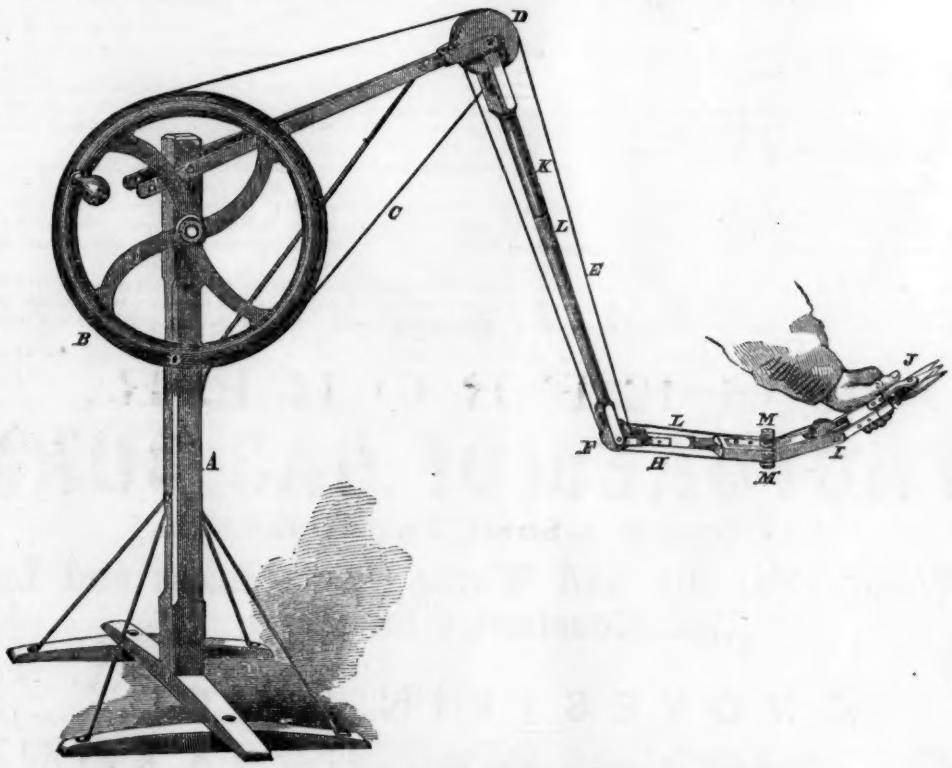
State and county rights for sale on liberal terms. For further information, call in person, or address by letter, E. Page Davis, 30 Pine street, (Room 4,) New York.

Miller's Adjustible Teeth for Saws.

There is scarcely a tool used in the mechanics' arts of more practical utility than the circular saw. Notwithstanding their high cost and the daily expense incurred in keeping them in order, they are used without limit. Formerly all saws were made by forming solid teeth on the periphery of the plate. Teeth thus made do good work, but are liable to be, and frequently are, broken off. There is no means of restoring them when broken, except by reducing all the other teeth to the same radius.

A patent has been recently allowed to Mr. W. P. Miller, of San Francisco, for saw-teeth constructed upon an improved plan, which are claimed by the inventor, to possess the following advantages over all others: The teeth being nearly encompassed in the plate, are rendered immeasurably stronger than even solid teeth formed on the plate; for reason of their great stiffness laterally, these saws may be fully one-fourth less in thickness than solid teeth, and one-third less than other insertable teeth saws; these teeth are self-attaching, and adjustible in their sockets, thereby differing from any other saw teeth; should the point of one or more of them become broken, by simply turning them forward in their sockets they will attain the necessary projection, then file them and the damage is repaired; these saws remain exactly the same size, and never can get out of round nor balance; these improved teeth are elastic, which insures a perfect fit, and a uniform distension in their sockets under any degree of temperature; ninety-five per cent. of the labor and files required to keep a solid tooth saw in order, or fifty per cent. as compared with other insertable teeth saws, will be saved by the use of these adjustible teeth; they cannot by any means, be thrown out of their sockets, and hence the operatives are secure from injury; these adjustible teeth will do three times more work without being worn out than other insertable teeth, for the teeth remaining in order need not be reduced to accomodate those that may be dull or broken; they are alike applicable to circular saws of every size and for all purposes, and are peculiarly adapted for cutting-off saws, as well as for splitting.

The teeth are held firmly in position by friction in a V groove. Letters patent were issued for this invention in September, 1866.



DR. M. C. DAVIS' SHEEP-SHEARING MACHINE.

Miscellaneous Items.

—It is stated that about two thousand miners are now at work in Louisa and Goochland counties, Virginia, and that the average is two pennyweights a day to each miner.

—During the month of August, upwards of one hundred telegraph poles were destroyed between Salt Lake and Sierra Nevada, by lightning; an accident that had never occurred before.

—Dr. Newbury, in an article on "Rock oils of Ohio" thinks he finds local proof of the distillation of petroleum in the great bituminous springs of California, from tertiary lignites' there being evidences of recent igneous action in the region. European geologists have attributed a similar origin to the petroleums of Italy.

—Coal oil is a better substance for preserving potassium and sodium than naptha. In coal oil sodium keeps its lustre for months, while in the purest naptha it is dimmed in a few days.

—The Revolving ship theory is to be reduced to practice. It will be remembered that the invention consists of a ship so constructed as to roll over the surface of the water instead of being forced through it.

—A letter from Australia says the gold fields of that country are rapidly becoming exhausted, and that those of New Zealand are answering the most sanguine expectations.

—Leaden bullets are sometimes *pressed* instead of *cast*. It is now said that they are unreliable, for they are not only heavier than the others, but they gradually expand so that after a time they regain the natural porosity of the metal.

—The Pennsylvania Steel company are erecting extensive works near Harrisburg, for the manufacture of Bessemer steel. They will commence with an annual capacity of 15,000 tons. Steel will soon supersede iron for many purposes.

—The action of sea water on *lead* is nearly imperceptible. It could be used, therefore, to good advantage for preserving the keels of iron ships from corrosion. Its hardness could be increased by adding arsenic or antimony.

—The locomotive whistles on the New-York and Albany railroad are pitched upon a lower key than usual, and the improvement is duly noticed and appreciated by the people who live near the road. The shrill shriek of the older style was ear-piercing and injurious to invalids.

Quartz Miners' Incomes.—Jules Fricot, a Nevada quartz miner, gives his income for 1865 as $182,511. This is the largest tax returned in California; the next largest is that of James P. Pierce, also a miner who resides in San Francisco. The figures are $102,-031.

Easy to Remember.—The length of the Atlantic cable from the point where it leaves Valentia Island to the spot where it is landed at Heart's Content, is precisely 1866 miles. It is a singular coincidence that its length should exactly conform to the date of the year of its completion.

The Diamond Excelled.—The crystalized protoxide of copper, recently found in crystals transparent to red light, in Chessy (Rhone) is said to far exceed in refractory power even the diamond. M. Fizeau has recently shown that both expand under heat.

—Mr. Amy assents to De Celamy's opinion that the apparent acceleration of the moon is due to real retardation of the earth, arising from friction in the tidal movements of the waters.

—A steam railway is to be built to the summit of Mount Washington. Half a mile has been completed, and is a success. Between the rails lies a wrought-iron ladder, in which the feet of the cogged driving-wheel find a firm hold. The ascent is one foot in three.

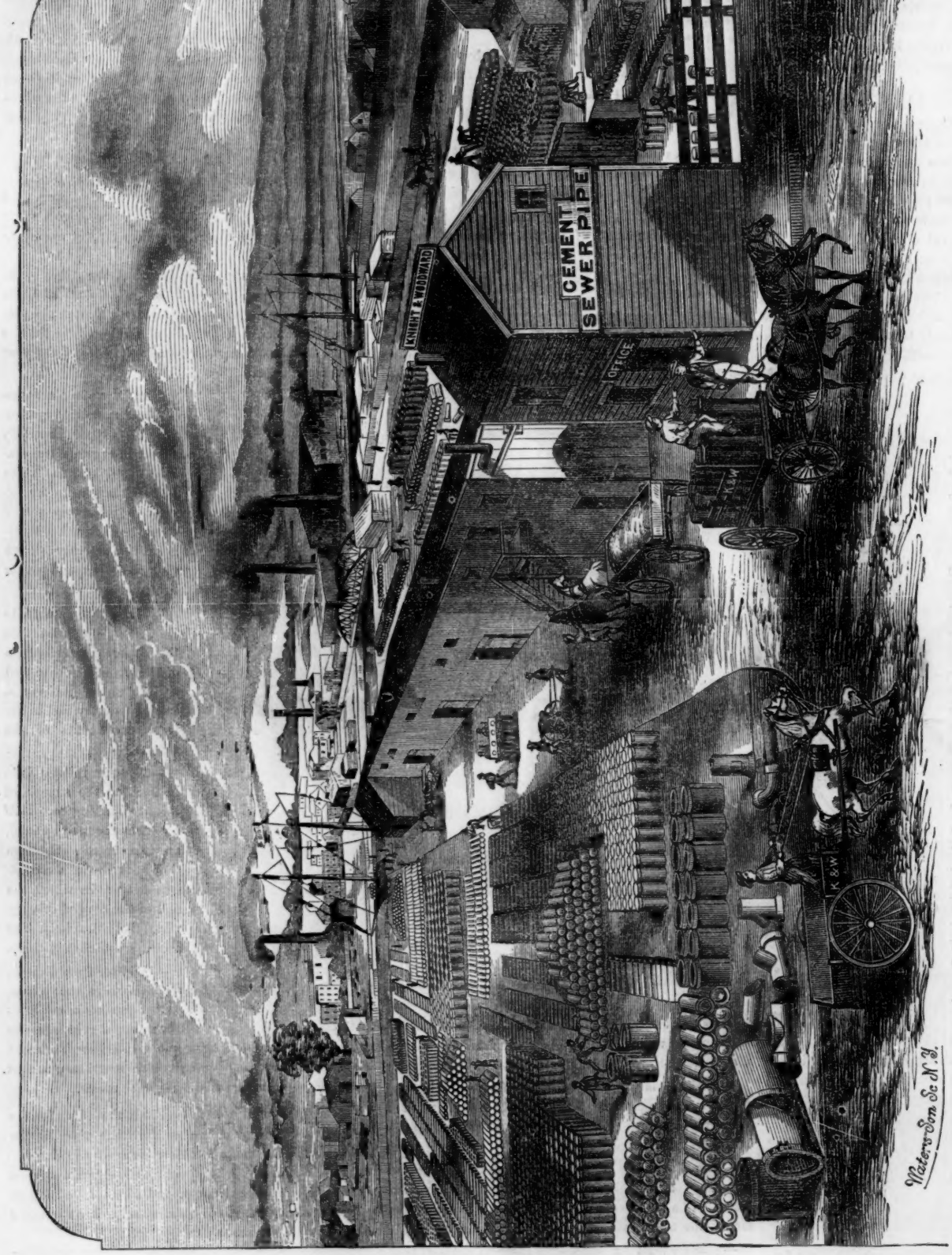
—A letter from Dalton, Georgia, says that a company there took out $10,-000 worth of gold from the mines in one day, and the capitalists of New York and Boston are about to ship extensive machinery to that place, for the purpose of working the mines.

—The diving-bell used in building the piers for the Newburyport bridge over the Merrimac river, is the largest bell ever made in this country—weighing upwards of six tons. It is pyramidal in shape, and is six feet square at the bottom, and about seven feet in height to the apex. It is constructed of iron two and a half inches in thickness.

JOB PRINTING.

STOCK CERTIFICATES,
ASSESSMENT RECEIPT BOOKS,
TRANSFER JOURNALS,
CIRCULARS,
HAND BILLS,
CARDS,
BILL HEADS,

And every kind of Job Work that may be desired, executed at the office of The American Gas-Light Journal, No. 22 Pine Street, New York.



CEMENT PIPE MANUFACTORY OF KNIGHT & WOODWARD.

"KNIGHT'S PATENT."

CORNER UNION AND BOND STREETS, GOWANUS CREEK, BROOKLYN.

OFFICE IN NEW YORK, No. 10 READE STREET.

HENRY KNIGHT. JAMES I. WOODWARD.

CEMENT PIPE, "KNIGHT'S PATENT," IS ALSO MANUFACTURED AND FOR SALE BY

Franklin Gerard, Newburgh, New York.
Warner & Co., Albany, West Troy, New York.
Jones & Haworth, Utica, New York.
Barrett Bros, Syracuse, New York.
D. Copland, Jun., Rochester.
Copeland, Rathbun & Co., Buffalo, New York.
I. W. Wilcox & Co., Springfield, Mass.
A. B. Lovell, Worcester, Mass.
D. Collins & Co., Boston, Mass.
Simeon Flint, Salem, Mass.
Caleb Crosby, Lowell, Mass.
Rheem & Giles, Georgetown, D. C.
Scowden & Co., Louisville, Ky.
Sprague & Crooker, Toledo, Ohio.
American Water and Gas Pipe Co., Jersey City, N. J.
New Haven Pipe Co., New Haven, Conn.

DEC. 29, 1866.